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THE

LONDON JOURNAL

OF

Arts and Sciences;

CONTAINING

FULL DESCRIPTIONS OF THE PRINCIPLES AND DETAILS OF

EVERY NEW PATENT,

ALSO

Original Communications

ON OBJECTS CONNECTED WITH

SCIENCE AND PHILOSOPHY,

PARTICULARLY SUCH AS EMBRACE THE MOST RECENT

INVENTIONS AND DISCOVERIES

IN

Practical Mechanics.

BY W. NEWTON,
CIVIL ENGINEER AND MECHANICAL DRAFTSMAN:
AND BY C. F. PARTINGTON,
OF THE LONDON INSTITUTION.

VOL. V.

[SECOND SERIES.]

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II. Kitchin and Smith's Window Frames and Shutters.

III. Vaughan's Pump; Dutton's Propelling; and Tucker's Improved Cannon.

IV. Banks' improvements in Steam Engines; Davis's Sugar Boiling Apparatus; Week's mode of heating Hot Houses; and Jobbins's improved Stock for Fulling.

V. Church's Knife Sharpener; Brunton's Gas Apparatus; Tucker's improved Projectile; and Ventura's Harp Lute

VI Knowles's mode of heating Hot Houses; Clutterbuck's Shears for Cropping Cloths; and Straker's improved Windlasses.

VII. Wright's improved Cranes; and Aspinwall's Type Founding Apparatus.

VIII. Fonzi's improved Stove Grates; and Westby's instrument for sharpening Knives and Razors.

IX. Braithwait and Erricsson's Fire Extinguishing Engine.

X. Church's Machinery for making Buttons.

XI. Prior's Fid; Brooking's Fid; and Bates's Sugar Pans.

XII. Wright's Machine for making Screws; and Green's improved Masts.

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No. XXV.

[SECOND SERIES.]

Original Communications.

ON THE REPORT OF THE PATENT-LAW COMMITTEE.

When learned doctors disagree,
Who may decide what law *should* be?

To the Editors of the London Journal of Arts, &c.

GENTLEMEN,

THE direct collision of opinion between men of acknowledged skill and practical experience upon the subject of the price of Patents for Inventions, forms a prominent feature of the Evidence taken before the Committee.—"Do you conceive that any inconvenience arises from the present expense of taking out patents?" "A very great inconvenience *and a very great objection.*"—W. Newton, Rep. p. 77. "Do you conceive that the expense of taking out a patent now is any evil?" "No. I think it would be better if it were more."—S. Clegg, Rep. p. 95. Mr. J. Hawkins maintains that the government ought to protect all inventions, *free of cost*, saving moderate office fees for labour performed.—(Rep. p. 128.) Professor Millington does not think the expense of a patent any evil, provided the patent was a secure property.—"I think it is rather an advantage that a patent should not be too cheap—the world would be inundated with them."—Rep. p. 101. Mr. W. H. Wyatt observes,—"There has been much complaint as to the expense of patents. If you decrease the expense much, and unless you did it, it would be no benefit, it would so increase the number of patents, that they would become a public nuisance; for notwithstanding the great expense of obtaining patents, there are patents continually obtained for the most trivial, absurd, and old things."—Rep. p. 105.

To the assumptions of the high price advocates, Mr. J. Macarthy, an inventor, gives a cool set down.—"To a man like myself, an officer on half-pay, *and having a family, the price is a very heavy expense.* An invention may appear *a very silly thing*, but at the same time, it may turn out *a very profitable thing*; and there may be a very valuable invention, that may perhaps, come to no good." Rep. 106.

That men of science, devoted to the prosecuting of discoveries, and development of the arts, should entertain a discreet jealousy of the injurious effects that would arise from allowing the human intellect to produce *ad libitum*, has a complete parallel in the history of the wisest and most calculating people of antiquity. The ancient Egyptians, notwithstanding their religious veneration for cats, well considered, that at the usual ratio of feline propagation, "the world would be inundated with them," (to use Professor Millington's happy expression,) and so that politic nation ordered that only handsome, full-grown, and amply endowed cats should be reserved for their divinities; and allowed all the unendowed and ugly Toms and tabbies, with their holy spawn and little sucking gods, to be drowned without scruple or remorse.

Our high-price-patent advocates, with equal antipathy to the embryo projections of inventors who cannot endow them with £.400 as a demonstration *a priori* that they are entitled to public support, would strangle or submerge them without the least compunction. These philosophemists, with a kind of left-handed assistance to inventive talent, would cordially apply to the projects of *poor* inventors, the Egyptian principle of drowning unendowed kittens.

The reasoning of the anti-reductionists is comprised in the following proposition:—No invention ought to be permitted unless the inventor, besides his wits, has £.400 to spend in the outset for the purchase of a patent security. Y. Z. cannot raise £.400, consequently Y. Z ought not to have any security, nor be allowed any protection in the prosecution of his invention.

Scholium.—The length of the purse of an inventor, is the only true measure of the value of his invention.

A few remarks upon the evidence of these gentlemen, will prove that they do not offer one reason for the continuation of the injurious and oppressive charges of patents, that will not resolve itself into the above formula.

In treating their opinions freely, I intend not the slightest disrespect to the parties; but upon a subject of such importance to thousands, whose industrious efforts are depressed—whose energies are withered, and whose useful talents are rendered unavailable by the blighting operation of the excessive costs of patents, it becomes morally imperative upon those who are able to expose the oppressions of this wretched system, to obtain, by every means of fair argument, a rational, efficacious, and available amelioration of it—an amelioration that shall meet the just requirements of *poor* inventors, and not a mere modification of forms, and increase of security for the sole advantage of the *rich*.

I trust these beneficent principles will form the basis upon which our legislators will proceed in this important question. An enlightened age demands measures suited to the progression of the human mind in estimating right principles, and to its advancement in the moral perception of what constitutes *justice* in legislation.

The opinions in favour of high priced patents all rest upon the following positions:—That high charges prevent patents being taking out for "trifling objects," and that low charges would produce a multiplication or rather "inundation" of patents, to the injury of the public. We will examine the value of these positions; their foundation, reason, and consequences.

All the anti-reductionists agree, instinctively, that high charges prevent patents being taken for "trifling objects;" but not a single amateur of high charges, has carried his intuitive perceptions to the extent of discovering, that high charges also necessarily exclude the prosecuting of inventions of value and importance in their several degrees. They prove the Scholium—that length of purse is the measure of merit. Their position halts for want of its other leg.

But, say some of the anti—there is no difficulty to find monied support for an invention of importance. This, as a general proposition, must be evidently fallacious; because there is the general insuperable difficulty of making known the nature of the discovery or process; which information must necessarily precede any estimate of the importance of the invention, and any arrangement for the advance of funds to the inventor for a patent.

But Mr. Hawkins's long and great experience in this matter is decisive.—"I have been for more than thirty years in the habit of being consulted, confidentially, by inventors in England, France, America, and Austria; and I have prevented a great number of patents being taken in England and France, by laying before the parties the difficulties they would be likely to meet with, in negociating with men of capital, *prior to taking out a patent*. I firmly believe that I am, at the present moment, the depositary of important inventions; which, if they could be patented *free of cost, and thus become marketable commodities*, they would immediately occasion employment to thousands of people; and I have no doubt many engineers could say the same. I know of several valuable inventions having been lost to the public by the death of inventors; when, if the parties could have been made secure, they would have treated with capitalists, and the inventions probably have become "staple articles of manufacture."

"Having extensive acquaintance with men of invention and of capital, I undertook, many years ago, to act as agent between the two classes, but was very rarely able to bring the negociation to a satisfactory conclusion, principally owing to the costs of the patent; and, indeed, I do not recollect that I ever succeeded in such a negociation, without taking upon myself the serious responsibility of recommending the invention; which recommendation common prudence generally hindered me giving, even when I thought highly of the invention: and finding from much vexatious experience, that such negociations tend only to waste the time of all parties, I have for some time declined attempting to bring capitalists and inventors together." Rep. p. 128.

Here then, is a practical, rational, and convincing statement of the difficulties inventors without the means of paying for our high priced patents, are subjected to; and of the extensive and incalculable injury which the commerce, arts, and revenue of the country sustain from year to year, by the retention of the absurd and excessive fees and duties upon patents.

It happens that none of the gentlemen, whose imaginations are so haunted with the dread of "trifling inventions," have been asked what they would deem trifling inventions, and how the public, not being forced to purchase or use them, can be injured by their being patented?

"Trifling inventions" appear a kind of non-descript chimera. If by the term, worthless and unprofitable mechanical speculations, or processes in manufactures are meant—that such can be injurious to the public after a very few trials, is a contradiction in terms; it is because the public *do not* purchase or use them, that they are *proved* worthless, and become unprofitable; and if the public forbear to purchace or use, where is the injury to the public? The failure is visited solely upon the over-sanguine, uninformed, or inexperienced projectors, who have spent their time and money in obtaining a monopoly for inventions or articles, which the public would have allowed them to monopolize without the charges of patents.

If by "trifling inventions," such discoveries and improvements as are too unimportant to come within range of professional notice, or such as are not immediately connected with the machinery and processes of our great staple manufactures, or generally such as may appear to scientific men trivial in their operation and results, the answers are to be found in the evidence. Mr. J. Macarthy gives the exclusionists a complete *conge.* He practically finds "that an invention may appear a very silly thing, but at the same time turn out a very profitable thing." How can an improvement be advantageous to the inventor, but by an advantage being derived from its use by the public? How can a thing turn out profitable excepting there be purchasers who find a value or convenience in the use of the thing? How could any invention, however trivial, become of such general use as to make a satisfactory return to the inventor, if it were not intrinsically more useful than that which it supercedes the use of? When the exclusionists have rationally answered these questions, they can proceed with the evidence.

Mr. John Farey, who seems to have devoted himself to the accumulation of every possible information—legal, technical, and practical—upon this extensive subject, and to whom the public are indebted for the able collection and arrangement of the mass of official papers, and adjudged cases which form the principal part of the copious appendix to the report—throws, by his evidence, a strong light upon the practical beneficial effects which *have resulted* to the public from the prosecution of trifling inventions, under patents where inventors have fortunately possessed the means of obtaining them. "I consider, in general," says Mr. F. "that the public derive some benefit from many patents for trivial inventions, such as snuffers, stirrups, lamps, cork-screws, and many other articles of domestic use, which can be of no material value to the public for the use and exercise of the inventions; but by the operation of patents, the making and using of patent articles (which have merit enough to sell) is multiplied and accumulated into considerable trades, which would never have arisen to any such extent without patents; because no individuals would have devoted themselves to have created such trades, if others could have supplied the demand as freely as themselves when created; but having been cultivated as distinct trades by interested patentees, such trades continue to be permanent after the expiration of the patents.

That is the origin of a number of considerable trades at Birmingham, Sheffield, and in London."—Rep. p. 141. Here are facts sensibly stated.

Mr. Farey, speaking merely as a practical man and not as a political economist, has not adverted to the immense public advantages resulting from the establishment of *considerable* trades in trivial improvements and *trifling inventions.* The employment of artificers and workmen, who would not have been reared and employed but for the establishment of such trades; the additional demand for labour in the construction of workshops, tools, dwellings, &c.—all formed of materials directly or indirectly taxed; the additional consumption of clothing, food and liquors—all taxed to the extent of bearing; the easing of poor rates in large manufacturing districts, by every new establishment which is profitably conducted; the employment of clerks, agents, travellers and other necessary persons, for the conducting and extending the use of the new manufacture or improvement, however "trifling" in the estimation of scientific professors, and exclusive machinists, whose intellectual orbits are dizzified by the rapid "*rotatory*" motions of their vast imaginations.

The above are the decisive—*and to the revenue—tangible results* of the encouragement by a monopoly to the inventors of "trifling" improvements when established as trades—which never could be done excepting consumers found an advantage in using the "trifling inventions."

There are other results not to be overlooked by economists and legislators; the spirit of industry and activity excited by the general encouragement of every man's talent—the spirit of satisfaction in the *protection* offered to his exertions—and the spirit of comparative acquiescence in those extravagancies and blunders from which "the best of governments" is not always exempt—that men fully and profitably employed are disposed to yield.

In the present state of the country, this last idea contains a volume of argument in favour of setting as many mens wits and hands to work, even upon the most "trifling inventions" as can be possibly abstracted from too close an investigation of the *principles* upon which institutions are founded, and from too practical efforts to mend the superstructure.

I have in a former letter fully discussed the inherent *right* of every man to have protection afforded to his mental property in matters of invention, as founded upon common law, independent of any estimate of the intrinsic value of such property; and the practical application of that sound principle to all other mental exertions, save those of inventors. The evidence of Mr. Hawkins supports the whole of my argument and views as to the necessity of immediately rectifying the anomaly between the principle and practice of the law in respect of inventions. He says, "I would propose patents to be put upon the same footing as copyrights, or rather as statuary; there is an act of Parliament for the protection of artists in forming statuary. I would just draw a parallel between an artist and an inventor. If I take a piece of clay, and model the likeness of a human head, or any other form that my fancy may dictate, and cast a copy of the same in plaister of Paris, I have a patent, or exclusive right to sell copies of it merely by putting my name and date of publication upon each copy; but if I take the same piece of clay, and spend the same time upon it, and model a useful article, a teapot for instance, and cast it in metal, I must pay from 100*l.* to 400*l.* for a patent for that article, which I consider a hardship. I would propose that the publication of any new discovery should constitute the evidence of exclusive right. I would wish to give my opinion, that the greatest encouragement ought to be given to every species of invention."—Rep. p. 128.

I shall conclude this part of the subject with a single observation. The high price of patents will not deter any one having 400*l.* at command, and the most trifling or absurd invention in his head from patenting it. No argument could ever persuade a man so situated that his invention would not answer; but we have proved *ad demonstrandum* that the exorbitant charges and duties of patents do keep important inventions from being prosecuted—to the injury of the parties, and to the great detriment of the public.

As to patented inventions, that are in their very nature obviously absurd,—a fool only could have prosecuted such, and only fools could purchase or attempt the use of them. In respect of such, I would apply the decision of Chancellor Egerton, who when a man applied for relief against the consequences of his deliberate mature act, replied, " Sir, I do not sit here to relieve fools." If we were to attempt to legislate against the absurd mis-employment of intellect, time and means,—I am afraid the higher classes would take an epidemic alarm, and have interest enough to stifle the inconveniently officious bill at the first reading.

I will shortly advert to the *consequences* apprehended by the exclusionists of " trifling inventions" and supporters of high price patents; and prove the entire fallacy of their reasons in those few instances, where an illustration of their positions has been attempted. Mr. M. Poole, a clerk in the Attorney General's Bill office, who like his employer, may be presumed to have an instinctive predilection for high fees,—" does not think the cost of taking out a patent too dear." Rep. p. 84. " What is the whole expense?" " About 360*l.* the three kingdoms, if with a short specification *and no opposition.*" (The reader will find some curious information as to " *oppositions*" in a former letter.) " What advantage do you conceive is derived to the public in making the price of the patent so high? It prevents patents being taken out for too trifling objects." It never, I suppose, prevents the prosecution of an important object? That is impossible, because an inventor who has not wits to obtain 360*l.* cannot be possessed of brains to excogitate an important discovery.

" What inconvenience do you think would result if patents were to become more numerous, and they were to be taken out for trifling inventions? It would be I think to the injury of the common tradesman. A patent is an exclusive right to the vending of a certain article, and of course the patentee has a privilege over the rest in the same trade; if he gets that privilege too cheap it would be to the injury of other tradesmen in the same line." If he makes a useful discovery, why should he not derive is protected." Mr. Few did not hit upon the converse of his proposition—that as the patentee ought to pay the expense of the commission "*by which he is* (*to be*) *protected,*" he ought *not* to pay the galaxy of Chancery and State patent-fees, *by which he is not protected.* But, upon the next question as to the *separate fees* for the *three* countries, this eccentric respondent is at a complete non-plus; "they must be provided for and apportioned *somehow or other.*" He then contrives to give the committee the go-by—"but my attention has not been before called to the subject." So much for the value of the opinions of this generous rewarder of duties *to be performed,* and payer of *duties unperformed,* always excepting the universal fulfilment of the official imperative obligation of taking the fees!

We will now proceed to the evidence of Mr. Samuel Clegg, a gentleman who has invented the rotary metre shewing the consumption of gas by the renters—a most ingenious and efficient piece of mechanism. But Mr. Clegg has, according to his evidence, expended in ten years of his patent, "some thousands of pounds upon his gas-metre, and scarcely got one into the market, Rep. p. 95, and yet was enabled to meet the opposition of "all the gas companies throughout the country almost," who were opposed to an extension of his patent beyond fourteen years, by act of parliament. A party possessed of such very ample resources, and who has so freely expended them upon a single project, is not probably the best judge of the economy that must be practised by less pursy inventors—Mr. J. Macarthy for instance, who is "but a half-pay officer, having a family to maintain." The opinion of such free and well-endowed spenders as Mr. Clegg, should be received with much caution in a question relative to the *price* of patents as affecting the encouragement or oppression of the arts and manufactures of the country. Rep. p. 95. "Do you conceive that the expense of taking out a patent now is any evil?" "No, I think it would be better if it was more." Other subjects intervene, but the subject of cost is resumed, p. 96. "On what grounds do you think the present charge for patents not too high?" "If it is any thing worth taking out a patent for, I think the expense no consideration, because half a year's profit would pay the expense of the patent." If a man has "some thousands of pounds" to expend upon the determined prosecution of an object, 300*l.* to 400*l.* for a patent, may be no consideration to him; but, if a man has not 400*l.* what is he to do with his invention, however valuable?—why, as Mr. Hawkins says it must die with him, and the public must lose the benefits. But even the *half year's profit* is not so certain though the thing be worth taking out a patent for, as I deem Mr. Clegg considered his upon which he spent "some thousands." "If the time could have been extended, it would have remunerated me for the expense, and I should have made a profit by it, but as it is, it is a loss to me; after a number of years, and the expenditure of a great deal of money in perfecting the machine, it is thrown open to the public without any remuneration to myself." Rep. p. 95. This proves Mr. Macarthy's shrewd observation, "there may be a very valuable invention that may perhaps come to no good." "If the price of patents was very much reduced do you think that patents would be taken out for very minute details." "I think," says Mr. Clegg, "in that case the patent office would be so loaded, that a person could hardly bend an iron in a particular shape without running the risk of infringing a patent." p. 96. This is so highly gratuitous and metaphorical, that I will leave Mr. C. the full enjoyment of his flight. "Do you mean to say that (300*l.* to 400*l.* for England, Scotland and Ireland,) is not too great an expense for a patent for the three kingdoms?" "No, I should think it no worse if it was a little more, it bears no proportion to the expense of completing a machine, or of defending it when it is infringed." This singular argument of Mr. Clegg, is one of the happiest efforts of the anti-reductionists, it affords a fine specimen of their reasoning powers. So then because an inventor is *necessarily* obliged to spend a large sum in completing his improvement, and is also *unnecessarily* obliged, by a miserable administration of law, to expend largely in supporting his just title against infringers, *these* are *reasons* why he ought to pay *more* than the present excessive costs of a patent! Upon the same principle of reasoning, Mr. Clegg would, I suppose, load a large ship, nearly sinking with its overcharged cargo, with a trifling addition of 30 or 40 tons, *because* such addition would bear no proportion to the weight of the cargo, and might even make her sail better. I apprehend Mr. C. would decline being on board during the sagacious experiment—and sincerely wishing him a half year's profit on his next speculation, take my leave of his conclusions.

I have adverted in the commencement of this letter to Professor Millington's opinions, "that the expense of a patent is not any evil, and that it is rather an advantage that a patent should not be too cheap." The inference is, that the present charges for patents are not too high. I believe that no inventor who has found the difficulty of raising 150*l.* to 400*l.*, will agree with the learned professor, who however, has not condescended to explain, *to whom* it is "*rather* an advantage that a patent should not be too cheap." The professor, no doubt, means the family of the Chancery and State fee-recepis, and in that view we accord. But "the world would be inundated with them if that were the case," i. e. if too cheap, Mr. Hawkins has no fear of the effects of "inundation," notwithstanding the eastern sublimity of the metaphor. He says, "I conceive the consequence of charging any considerable sum for patents is, that none but bold speculators take a patent, and hence it is that so few prove profitable; and my view is also, if patents were given *free of cost*, the public would be benefitted by the inventions of the cautious and sober-minded, and thus a source of permanent wealth to the country would be opened." Rep. p. 127. He continues—"it is apprehended by some that the great increase in the number of patents which would be the consequence of throwing off all the fees, would occasion so much litigation as to become a great public inconvenience; it is very probable that more litigation would be generated by the increase of a thousand ships employed in commerce, than by the increase of a thousand patents; but who would imagine that the increase of a thousand ships employed in the commerce of the country, would be a public inconvenience?" p. 128 This is a pretty good embarkment against the "inundation;" he might have added—the increase of a thousand ships in commerce would send ten thousand additional letters through the post-office, but neither government nor the public would take alarm at the increase. Mr. Wyatt's apprehension of the number of patents becoming "a public nuisance," in case of a great reduction of the charges, is about as reasonable as the learned professor's fears of an "inundation."

One short answer will suffice for all the alarms of the anti-reductionists. If patents are obtained in consequence of a considerable reduction of the fees and duties, "for trivial, absurd and old things," the evil will soon work its own cure; the public will not buy, or use *even gratis*—the "trivial, absurd and old things." If patents are obtained for the exclusive protection of inventors in their property, in respect of articles and processes which the public *will* buy and use, this is the plainest proof that the public find *some* advantage or convenience which they did not before possess; and consequently that no inconvenience can arise to the public as consumers from the "inundation" of patented articles, whether the inventions be important or otherwise; whether they be "trifling objects" in which flourishing and permanent trades may be established, or great projections of scientific men, which may end in the ruin of the adventurers. At any rate the competition arising from the universal and free exercise of the talent and ingenuity of a vast community, continually progressing in the principles of knowledge, must produce eventually an incalculable accession to the moral, physical and political resources of this vast empire, and a continually increasing amount of the means of comfortable subsistence to its laborious and active population.

Against these extensive and beneficial results—not vainly and irrationally surmised—the unreasonable fears and alarms, and the false deductions of those who would continue the oppressive and injurious charges of the present system of patents under the seals, vanish into unideal nothingness. Justice, policy, and the spirit of the times, unite in strongly demanding the immediate abolition of every pretension which militates against inherent rights, reasonable requisitions, and the advance of the human intellect, in estimating true principles of legislation.

VINDICATOR.

Recent Patents.

To THOMAS CHEEK HEWES, *of Manchester, in the County Palatine of Lancaster, Engineer, for his having invented or found out various Improvements in the form and construction of Windmills and their Sails.*—[Sealed 14th Jan. 1829.]

THESE improvements are certain mechanical contrivances designed to increase the power of a gentle current of wind upon the sails of a windmill; and to vary the speed according to circumstances, which are described by the Patentee as follows:—

SPECIFICATION.

Plate I., figs. 1, 2, 3, and 4, represent various views of my improvement, for varying the speed of the flour stones, machinery, or other work, with which the mill is connected, and thereby allowing the sails of the mill to move at a greater variety of speed than in mills of the ordinary construction.

Fig. 2, is a plan of part of the geering, in which *a*, represents a section of the perpendicular shaft, connected by bevils in the ordinary manner to the wind shaft above. Through the shaft *a*, power is conveyed to the horizontal shaft *b*; and thence by the bevils at the further extremity of *b*, to the shaft *c*, and onwards to the work to be performed.

This train of movements will also be seen more plainly in the elevation of the same parts in fig. 4, and the speed and proportion of wheels used, are calculated for the ordinary velocity of the windmill sails; but my method of varying the speed as before named, depends on the annexed parts shewn in figs. 1, 2, and 3. Fig. 1.

is an elevation of a carriage of wood or other suitable material, which supports the perpendicular shaft *d*, along with the horizontal shaft *e*; to which *d*, is connected by the bevils as seen in the fig. and on the shaft *e*, are placed the different sized spur wheels represented at *f*, *g*, *h*, *i*. The whole of this carriage with its appendages, as represented in fig. 1, is placed parallel with the shaft *b*, and supported in such position that the wheel *k*, on the shaft *d*, can be brought into geer with the wheel *l*, by raising the latter on the shaft *a*, when required, by means of the bos of the wheel *l*, to which the wheel *p*, is also connected, sliding on the shaft *a*, as shewn in the tranverse section of this part at fig. 3; where the dotted lines shew the position of *l*, when in geer with the wheel *k*; in which position it can be keyed in the usual manner when required. It may also be observed, that when the wheels *l*, and *k*, are put into geer, the bevil *p*, is at the same time out of geer; *m*, *m*, *m*, seen in figs. 1, 2, 3, represent parellel arms, by means of which the whole of the arrangement of parts represented at fig. 1, are held parallel to the shaft *b*; see figs. 2 and 3. These arms *m*, *m*, *m*, vibrating on three fixed centres at *a*, and *n*, allow the shaft *e*, to be receded or brought nearer to the shaft *b*, without varying the distance of the centres *d*, and *a*, as will be more plainly seen by reference to the dotted lines in fig. 2; and by the same action of placing the parallel shaft *e*, and *b*, at any required distance, I am enabled to connect the wheel *o*, (which slides on the shaft *b*,) with any of the wheels *f*, *g*, *h*, or *i*, and thereby vary the speed of shaft *e*.

By this latter arrangement the motion imparted from the perpendicular shaft *a*, instead of proceeding through the bevil *p*, to the shaft *b*, and onwards as first described, is taken through the wheels *l*, and *k*, to the shaft *e*, as shewn at fig. 1, from which shaft it is returned to the shaft *b*, by some one of the wheels *f*, *g*, *h*, or *i*, according to the speed required.

My next improvement, represented in figs. 5, 6, and 7, is for the purpose of rendering the helm sails, or those small sails usually applied for the purpose of keeping the main sails in the proper direction to the wind more efficient, and capable of acting with a slighter variation of the wind than those of the ordinary construction; and this I effect by the combination of a vane or weather-cock, connected with the small helm sails of the ordinary construction, but which, in consequence of this combination may be made much smaller than usual and still act with a better effect; fig. 5, is an end view; fig. 6, a side view, and fig. 7, a piece of the same part; *q*, *q*, *q*, *q*, represent the usual framing projecting from the back of the mill-head, and *r*, the small helm sails by means of which the main sails are kept to the wind, the wheels and shafting by which this effect is produced, are of the ordinary arrangement and construction, but the small helm sails *r*, along with the upper part of the geering, instead of being attached to the framing *q*, *q*, *q*, *q*, are supported in the frame *s*, *s*, *s*, *s*, see fig. 5, and allowed to vibrate or move horizontally on the centre *t*; the position of these small helm sails, with respect to this perpendicular centre being determined by the position of the vane or weather-cock *u*, to which it is connected as shewn in figs. 6, and 7.

Thus, I suppose the wind to blow in the direction of the arrow seen at fig. 7, which would scarcely effect a stationary helm sail, the broad surface of the vane or weather-cock *u*, would be carried in the direction of the dotted lines in fig. 7; and by its connection with the small helm sails *r*, place them in the position, as also shewn in dots in the same figure, and thereby enable them to receive the effect of the wind in a much more direct manner, than if they had remained stationary as in the ordinary construction. And supposing the wind to vary in either direction in ever so slight a degree, the broad flat surface exposed by the vane or weather-cock *u*, will be immediately acted on, and the small helm sails brought into action, which will again be put out of action by the same means as soon as the weather-cock or vane shall have assumed the position shewn in figs. 6, and 7.

My improvement on the sails of windmills (by which I mean the main sails which do the work) consists in a certain construction or arrangement of parts, by which I brace or frame the sails much stronger with less material, and expose a much greater surface to the wind, thereby rendering them of considerably less weight and more effecttive; fig. 8, represents a front view of the framing of the arms or whips for eight sails, to which the cloth or weather boards are to be attached, part of the whips or arms marked *y*, being broke off as unnecessary for the explanation. The number of sails may be varied at pleasure, and as much of the whole surface contained in the circumference of the sails filled with cloth or board as may be required; fig. 9, is a sectional side view of the same; and fig. 10, is a back view on a smaller scale, to show the general effect when the sails are clothed or boarded.

In constructing these sails I have formed the bos or flange, to which the whips are attached of cast iron, as shewn at *v*, *v*, *v*, in figs. 8, and 9, where it will be seen that the whip does not radiate from the centre of the wind shaft *w*, but from a point near the circumference of that shaft, and that the back whips or arm in figs. 8, and 9, intersect the front whips at a short distance from the centre. This is effected by using the same bos or flange reversed for both the front and back set of whips or arms, so that the back and front whip or arm which belongs to each sail, radiate from points on the opposite sides of the circumference of the wind shaft, and the iron braces *x*, which are attached to each of the whips or arms for the purpose of strengthening them, are at their opposite extremity, attached to the opposite flange or bos to which the whip or arm is connected.

By reference to fig. 9, it will be seen that neither the front or back arms of the sails are at right angles to the wind shaft *w*, but gradually approach each other towards their outward extremity, thereby forming the requsite inclination of each respective sail; which inclination can be varied as circumstances may require, by increasing or diminishing the distance of the two lesser flange pieces *v*, on the wind shaft; but this, as well as the angle formed by the back and front whip or arm of each sail, can be varied as required. The proportions which I have found answer for the latter, for sails of sixty feet diameter, are as follows:—First, divide the diameter into eight parts, and take three parts for a pitch dimameter; then let a line, produced from the back and front arm or whip of each sail, unite in the pitch-line or diameter, which will give the angles formed by the whips or arms with each other. To make this more clear, see fig. 10, where the dotted lines a, a, are produced from the arms or whips of the sail on the opposite side of the windshaft, and unite at c, in the pitch circle b, b,b, b, which is three-eighths of the whole diameter of the sails.

As regards the form of windmills, erected with my various improvements above described, I am not limited to the ordinary circular form in which they are usually constructed; which form is the result of the lengthened sails, which necessarily require a circular building, to allow of their turning to face the wind in any direction it may blow;

that from the increased amount of surface exposed in sails, on my construction, a much shorter length of whip-arm or diameter, is sufficient for the same amount of power; and I am thereby enabled to place a small lantern-tower, for the purpose of carrying my sails on any buildings of either an oblong, square, or other convenient shape; and am in no way confined to the inconvenient, expensive, and crowded form of ordinary circular windmills, to which, nevertheless, my improved sails are in every way applicable, as they may be fixed on the old windshaft; and it is by this application to windmills already in existence, that I consider them of the most extensive importance. I would also recommend their utility to water mills, where from floods or scarcity of water, during the summer, work is often impeded, under which circumstances they would enable the miller, in many cases, to gain considerable additional power.

This latter application of my improved sails I have already applied in aid of steam engines, where it is found of great advantage and an immense saving in the expenditure of fuel.

Having now described my various improvements in the form and constitution of windmills and their sails, I do hereby declare that I do not claim any separate portion or part of such machinery, but I do claim such combination or arrangement of parts as hereinbefore described, by which my various improvements are effected. And lastly I declare that the speed and general construction of the various parts of my improvements hereinbefore described may be modified and varied, all which modifications and variations producing the same effect and results may be attained by any person of competent skill, and fit to be entrusted with the construction of machinery of this or a like description.—[*Inrolled in the Inrolment Office, July,* 1829.]

Specification drawn by Mr. Nicholson.

To the Rev. THOMAS KILBY, *of Wakefield, in the county of York, Clerk, and* HUGH FORD BACON, *of Leeds, in the same county, Gentleman, for their having invented or found out a new or improved Gas Lamp or Burner.*—[Sealed 2d July, 1829.]

THE object of this improvement is to regulate the supply of atmospheric air to the burner of a gas lamp, in order to afford such an exact quantity of oxygen as shall be best suited to the production of the most brilliant light, and at the same time the utmost economy of gas.

The Patentees describe their invention by the following

SPECIFICATION.

"The improvement or improvements we have invented is applicable to the kind of gas burners commonly known by the name of Argand burners, which are so constructed as to permit an external and also an internal current of atmospheric air, to effect the combustion of the gas in the most advantageous manner. But it has frequently been observed, that as Argand burners are at present constructed, there is no adjustment for the supply of atmospheric air; the internal aperture, and also the external openings made in the glass holder for the admission of air being fixed and invariable. Neither has due attention been paid to the shape or form of the internal apertures, owing to which two most important objects have been entirely omitted; namely, a method of duly limiting the quantity of atmospheric air supplied to the gas through the internal passage or aperture, and also the shape of that part of the internal aperture from which the air escapes, and at which place it should be duly limited, and be made to impinge or strike upon the internal cylinder of the flame in the most advantageous manner, and thereby increase the light.

"Various attempts have been made to adjust or limit the supply of air to the burner externally, by diminishing the openings in the glass holder, but very little advantage was obtained in this way while the internal passage or aperture remained the same, for it is only by a combination of the two, when properly formed and adjusted, that the most intense light can be obtained with the smallest proportionate consumption of gas; and having effected these most important advantages, by means of our invention, we shall now show, by a careful examination and description of the common Argand gas burner, where the imperfections exist, and also shew how we have invented and applied such improvements as will make gas burners of this description more economical.

"Plate I. fig. 11, represents a vertical section through the centre of a common Argand gas burner; *a, a,* represents the aperture or internal diameter of the cylindrical passage, through which atmospheric air is supplied to the internal surface of the flame. It will readily be seen that the passage is perfectly cylindrical from *a,* to *a,* the lower end being spread so as to resemble the mouth of a trumpet; *b, b,* are two sides of the external cylinder, enclosing the space *c, c,* through which the gas passes and supplies the flame, being emitted through various holes drilled through the steel plate *d*; *e,* is a shoulder upon which the glass holder rests, and *f,* is the forked passage which terminates below in a female screw, by which it is attached to the branch or supplying pipe. Fig. 12, is a bird's-eye view of a glass holder, commonly used with the kind of burner seen at fig. 11. It will be seen that the spaces between the radial bars, through which the air passes to supply the external part of the flame, are fixed and determined, there being no contrivance to adjust or limit the quantity of air which passes through them. Fig. 13, represents a plan of a brass plate, pierced with a number of holes; this plate rests upon the four bars of the glass holder, and limits the supply of air by diminishing the space through which it passes.

"Fig. 14, represents a section of the same plate, through the parts shewn by the line 1. 2. in fig. 13. This kind of adjustment has frequently been used, but the advantage obtained in point of economy was so trifling, that it has very rarely been adopted, being insufficient by itself to produce any very beneficial result; but when it is combined with other means, which we have invented, its use is rendered highly important as regards economy, there being a considerable saving effected in the consumption of gas used by the common Argand burner to produce the same intensity of light. Fig. 15, represents a vertical section of a common Argand burner, the same letters being placed to designate the same parts described before in fig. 11 ; *g*, represents a section of a cylindrical piece of metal, having a hollow frustrum of a cone formed in it internally, as shewn at *h*. This frustrum of a hollow cone is inserted, by which means the smallest aperture is placed downwards, forming the means of limiting the supply of air to the internal part of the flame, and by making the part from *h*, to *g*, conical, or any shape that will permit the air to spread or expand so as to strike against or impinge on the flame ; a great increase of light will be effected by this additional appendage when it is combined with an external adjusting plate before described in fig. 13.

From the experiments that have been made, it has been found that the aperture and angle of the conical passage will admit of little variation (as hereafter stated) from those given in the drawing, though the dimensions there shewn have given the most satisfactory results. It will also be seen that as the cylindrical piece *g*, forming the adjustment, may be detached, it will be perfectly practicable to apply it to any of the Argand burners now in use; or burners may be constructed with our improvement in a solid manner, as shewn in fig. 16; the principle in each can be the same. Fig. 17, represents a section of a common Argand burner, having another kind of internal adjustment applied, which we call a diaphragm. The aperture in this is the same as the smallest end of the conical tube *g*, before described; and the space above it *i*, acts in a similar way as the cone *g*, in permitting the air to spread and strike against the flame, but not so advantageously; for although by the application of this improvement, considerable advantages are obtained, yet the greatest will be effected by the conical shape we have described; and although we have, in the drawing, represented our invention as applied to Argand burners of a cylindrical form, yet the same principle may be applied to any kind or form of Argand burners, where the flame is supplied with an external and internal current of atmospheric air.

And we hereby declare, the improvement we have invented on the gas lamp or burner is herein set forth and explained, and that it consists entirely in constructing and applying a hollow frustrum of a cone, or a diaphragm to an Argand burner in the manner and way we have described, which being combined with the well known external adjusting plate (and which we do not claim as our invention) will produce a degree of economy in the consumption of gas. In conclusion, it is necessary to remark that the figures in the plate are one fourth the size in general use, as near as may be, but a slight enlargement or diminution of the angle and aperture of the cone may be adopted with advantage according to the purity or impurity of the gas. The less pure gas requiring a larger aperture in order to increase the combustion.

[*Inrolled in the Petty Bag Office*, 1829.]

Specification drawn by Mr. Tyrrell.

To William Henry Kitchen, *of High Street, in the Parish of St. Giles, Bloomsbury, in the county of Middlesex, Ironmonger, and* Andrew Smith, *late of York Terrace, in the Parish of St. Margaret, in the City of Westminster; but now of Princes Street, Leicester Square, in the same City, Merchant, for their Discovery or Invention of certain Improvements in the construction of Window-frames, Sashes, or Casements, Shutters, and Doors, designed to afford security against burglars, as well as to exclude the weather.*—[Sealed 7th Feb. 1829.]

SPECIFICATION.

"Our improvements in the construction of window-frames, sashes or casements, shutters, and doors, are designed for the two fold purpose, of protection against burglars, and for excluding the wind and rain. Such parts of these improvements as apply to the raising and lowering shutters, may he considered as additions to, and variations of the invention of constructing and applying metallic shutters, for which His Majesty was graciously pleased to grant his royal letters Patent, to me, the said Andrew Smith, and Thomas Don, my then partner, dated 15th June, 1827, and which said patent has now become my exclusive property. The improvements on the said metallic shutter consist in the means of raising and lowering them; the particulars of which are exhibited in the accompanying drawings. See Plate II.

"Fig. 1, is a front view of a series of three metallic shutters, *a, b, c,* which are designed to move up and down in suitable grooves formed in the side frames *d, d, d, d*; fig. 2, is a section of the same, exhibiting the grooves in one of the side frames, and also the box *e,* at bottom, in which the shutters are intended to be enclosed when lowered. The front of this box is supposed to be removed in fig. 1; a plan or horizontal section of fig, 1, is shewn at fig. 3, the shutters being lowered into the box. Two screw rods *f, f,* are placed vertically one on each side of the window, and supported in bearings at top and bottom; the screw boxes *g, g,* are affixed to the sides of the upper shutter, and consequently on turning the screws *f,* the shutter will be made to ascend or descend. At the lower extremity of each screw rod, there is a bevil toothed wheel *h, h,* affixed, which respectively take into the bevil toothed wheels *i, i,* and the action of these two wheels *i, i,* are connected together by the endless chain *k,* see fig. 3, which passes over the spur wheels *l, l,* fixed on the same axles as *i, i.*

"By applying a winch to the axle of either of the wheels *i,* the bevil gear will be driven, and the screw rods *f,* by that means being made to revolve, the screw boxes *g,* will ascend or descend, carrying the shutter up or down according to the direction in which the winch is turned; the several shutters having dovetailed rebates at the metting bars, as seen in the section, the upper shutter will lift the lower ones.

"Fig. 4, exhibits a slight variation from the preceding, the shutters in this case being intended to close up into the entablature above the window; the screw rods *f,* which carry the screw boxes *g,* affixed to the lower shutter, are in this figure driven by bevil gear, which is actuated by a winch applied to the axle of a bevil toothed wheel *m*, taking into a corresponding wheel fixed on the horizontal shaft *n*, *n*, a section of which is shewn at fig. 5, there being studs *j*, *j*, *j*, *j*, fixed on the top rails of the two upper shutters, and as the lower shutter rises it lifts the next in succession above it, and by that means closes it into the recess behind the entablature. Another mode of raising and lowering shutters of this description is by means of endless chains passed over spur wheels, as shewn in the front view, fig. 6, and in section at fig 7. In this construction there are endless chains adapted on each side of the window in place of the screw rods before described; which chains *o*, *o*, pass over pullies *p*, *p*, at top and round spur wheels *q*, *q*, at bottom (the chain being attached to the top rail of the upper shutter at *r*, *r*.) By turning the winch at bottom, the bevil gear will cause the axle *s*, and spur weeels *q*, *q*, to revolve, and hence to traverse the chain, which by that means raises or lowers the shutters. In the two last described figures, the shutters are represented as being raised from the box below; a similar contrivance with endless chains might also be adapted to lower the shutters from a box in the entablature at fig. 4.

" Our improvements on window-frames, sashes or casements, apply to what are denominated French casements, and consist in the adaptation of sliding bolts of a peculiar construction.

" Fig. 8, shews a pair of glass doors or French windows, bolted together by the improved fastener, as shewn by dots; and fig. 9, exhibits the edge of one of the meeting stiles with the bolts projected forward at *a*, *a*. Figs. 10, 11, and 12, are sections of parts of the meeting stiles drawn upon an enlarged scale; *A*, and *B*, represent the two meeting stiles of the window; *A*, being the stile in which the groove *a, a,* is formed to receive the bolts *b, b,* when projected (which are seen in that situation at fig. 11;) and *B,* being the stile to which the projecting bolts are attached with the pinion for moving them; the bolts *b, b,* are too straight bars extending from the middle to the top and bottom of the stile. It will be seen that the two bars partially lap over each other in the middle, and that a rack piece *c,* extends from the inner extremity of each bolt diagonally at opposite angles; *d,* is a pinion, the teeth of which take into the racks *c, c,* and the bolts being enabled to slide by means of the guide pins *e, e,* working in the slots, the turning of the pinion by its knob or handle, (see the horizontal section, fig. 12,) will cause the bolts *b, b,* to be projected diagonally into the grooves *a, a,* as at fig. 11, which locks or tongues the two stiles of the window together, and excludes wind and rain, and also introduces the outer extremities of the bolts into mortice holes *f,* in the sill and in the top rail of the window, so as to bolt the sashes securely. By turning the pinion the reverse way the bolts will be withdrawn, as at fig. 10, and the sashes of the window will then open.

"Figs. 13, and 14, represent vertical sections of the stiles of the window, as at figs. 10, and 11; but having a plate *g,* affixed to the knob or handle with excentric slots in which pins *h, h,* attached to the bolts act, for the purpose of projecting the bolts instead of employing the rack and pinion described in the preceding figure.

"For the purpose of excluding the wind and rain at the bottom of the window, a sliding or projecting bar is employed, shown in figs. 15, 16, & 17; *C,* is the bottom rail of the window, in which a groove or recess is formed for the reception of the bar; *a, a,* is the bar extending along the bottom rail of the sash or casement *A,* as seen in fig. 15, and in cross section in the other two figures; the bar is connected to a plate in front of the rail within the recess by pins, which pass through slots *b, b,* and allow it to rise and fall; *c, c,* is a spring attached to the bar in the middle, and supported upon fixed pins at the ends; this spring keeps the bar up as in the section fig. 17, which is its situation when the window frame is open, but in closing the casement, as at fig. 16, the tail of a lever *d,* comes in contact with the back of a bevel edged bar *e,* called the weather bar, set in the sill of the window *D,* and the lever being by this means thrown back, the segment of teeth on the circular part acting in the rack at the back of the projecting bar *a,* causes that bar to be brought down over the bevil edge of the weather bar *e,* as at fig. 16; by which means the wind and rain are totally excluded; and on opening the casement again, the force of the spring *c,* lifts the projecting bar *a,* up into the position shewn in fig. 17.

" Our improvements in doors consist in constructing them of sheet iron, and covering or framing them by forming the stile and rails and mouldings of wood, which may be attached to the iron by screws or pins, or any other convenient means, as shewn in the front view, fig. 18, and in section at fig. 19; the hinges and lock, or other fastenings being of metal, are attached to the iron plate, and hence in case of fire all the wood work may be burnt away, and leave the door closed and secure. The locks or fastenings which we propose to attach to these doors, for the purpose of affording greater security against burglars, are so contrived as to project the bolts in four different directions, that is to shoot into the two jambs of the door case, and into the top and bottom at the same time, as shewn by dots in fig. 18. One mode of constructing these locks is shewn in figs. 20, and 21, the face plate being removed to exhibit the interior; *a, a, a, a,* are four bolts passing through slots in the sides of the metal box, and confined by guide pins; near the inner extremity of each of these bolts a rack is formed, and in the centre o the box a pinion *b*, is mounted, taking into all the racks the turning of which pinion, either by a knob or a key, causes the bolts to be projected outward, as in fig. 20, which locks the door, or inward as in fig. 21, which unlocks it; a tumbler *c*, may also be introduced in the back for protection. Figs. 22, and 23, exhibit a similarly contrived lock with four bolts, but instead of the racks and pinion, a plate *d*, with slots is employed, through which pins are passed from the respective bolts; the turning of this plate therefore causes the bolts *a, a, a, a,* to be projected outwards as at fig. 22, or inwards as at fig. 23.—[*Inrolled in the Roll's Chapel Office, August,* 1829.]

Specification drawn by Mr. Newton.

To Charles Harsleben, *of New Ormond-street, in the county of Middlesex, Esq. for certain improvements in Machinery to be used in Navigation, chiefly applicable to the propelling of ships and other floating bodies, and which improvements are also applicable to other purposes.*—[Sealed 3d April, 1828.]

The subjects of the present Patent are to be considered as further improvements upon and additions to a former Patent "for improvements in constructing or building ships and other vessels applicable to various useful purposes, and in machinery for propelling the same," granted 20th Dec. 1826: for a description of which see Vol. III. of our Journal, Second Series p. 204.

The novel features at present proposed are divided into five heads; 1st, a frame-work, constituting the wheel which holds the paddle arms, described in the former specification, for the purpose of enabling the paddles to be placed in a different position to those exhibited under the previous patent. 2ndly, the introduction of springs to prevent the concussions which would otherwise occur as the paddles turn upon their axles, in entering into, and passing out of the water; 3rdly, an improvement in the construction of the paddle wheel boxes; 4thly, a new arrangement of cranks for applying the power of manual labour; and, 5thly, a new application of rudder to the bows of the vessel, and wings to the keel.

Plate I. fig. 18, represents a portion of the paddle-wheel, turning vertically against the ship side without its casing; as it would appear on that side which is next to the vessel. *a*, is the axle, to which is affixed a central block with steps to receive the ends or pivots of the rotatory paddle arms *b*, *b*, *b*; an outer ring *c*, *c*, *c* carries the plummer blocks, in which the paddle arms turn, and this ring is made fast to the central block by bracings *d*, *d*, *d*. These bracings constitute the first feature of novelty claimed, and are designed to enable the wheel to revolve without obstruction from wind or surf.

The box of the paddle wheel, which is the third feature of improvement, is constructed with a flat ring fixed in the situation of *e*, *e*, *e*. On the face of this fixed ring the broad sides of the rectangular oblong tappets *f*, *f*, *f*, near the ends of the paddle arms, are intended to slide as the wheel goes round; by which means the positions of the paddles are all fixed, standing edgewise, and so entering the water; but a part of the ring being broken away, as at *g*, the tappet when it arrives there looses its bearing against the ring *e*, and the paddle arm is turned one quarter round, by another tappetat right angles to the former, striking against the edge of a segment of an inner ring *h*.

The paddle is, by means of the last-mentioned tappet and the inner segment, kept in the position that presents its broad face to the water as long as the tappet slides against the face of the segment, which it does during the time necessary for giving the propelling stroke, and then the paddle turns again into its former position, and passes out of the water edgewise.

At those points of the rotation of the steel where the tappets come against the inner segment and turn the paddle shafts, springs are to be introduced for the purpose of preventing the jar or concussion which would otherwise take place. Spiral springs are proposed, but in what way they are to be attached is not shewn: this, though placed here for the purpose of being better understood is the second feature of improvement.

Fig. 19, shews the construction of crank proposed to be applied, in order to drive the propelling wheels by manual labour; *a, a,* is the shaft of the crank which is to be placed upon suitable bearings; *b,* is the crank to be turned by the hands of a labourer; *c, c,* are two treadles which are connected to the crank, and are to be actuated in the same way as foot lathes are commonly worked. Fig. 20, is another mode of constructing the crank, in which there are two opposite cranks to be driven one by the right and the other by the left hand of the labourer, and two treadles for his feet.

The new application of a rudder consists in adapting a rudder at the head or bows of the vessel, as well as at the stern. This additional rudder may be attached in any convenient way by tackling or otherwise, and is intended to act as a leeboard, standing in the opposite direction of that of the stern rudder, the employment of which will materially facilitate the speed of the vessel.

The wings proposed to be attached to the keel of a vessel are to be made in a dove-tail form, wide at the bottom, extending on each side the keel along its whole length. They may be made by strips of sheet copper, supported by brackets, or of solid wood. It is considered by the Patentee that these wings will prevent the water passing under the vessel, when pressed upon by the wind, and will thereby steady the vessel and assist its propulsion.—[*Inrolled in the Inrolment Office, October,* 1828.]

REPORT

Of the Select Committee of the House of Commons on the Laws of Patents.

(Continued from Vol. IV. page 367.)

Mr. John Taylor, further examined.

Will you suggest any thing which occurs to you, as likely to be beneficial in altering the present law as to the length of the time for which patents should be granted?—For the same reason which I have given in my reply to a former question, I think there should be a difference between the time patents should run which are taken out for trifling inventions, and more important ones, or which involve great expense.

Is there but one period for all patents?—Only one period, fourteen years; but they have been sometimes enlarged beyond that period by Parliament.

Are you acquainted with the law of France upon patents?—Not very well.

Patents there are taken out for shorter periods, are they not? —Yes.

Are you aware that they are taken out at a smaller expense? —Yes.

In France a man may take out a patent for five years, may he not, at a third of the expense to what he can here?—Yes, he can take a patent out at a very small expense; it is I believe common to take out patents for four or five years.

Do you think such an alteration, in the law of this country would be beneficial?—I think it would.

Are there not inventions where the inventors can only calculate on the invention remaining in vogue for a very short time, the kaleidescope for instance?—Yes, certainly; they never can calculate upon any profit except on the first sale, because it would be idle to bring actions for every interruption of such patents

Would it not be just then, in such case, that the inventor should be allowed to apply for a patent, for such a period short of fourteen years as he pleases, paying a proportionate fee?—I should think that would be advantageous.

Would it also be desirable, that a man taking out a patent for five years, at a third of the cost of a patent for fifteen years, should be allowed to add any improvement which might occur to him subsequently to his original patent, and take the whole out for the term of fourteen years at the expense of one patent? —I think that would be somewhat consonant to the French law.

That he might take out a fresh patent for the improvement, if he chose, at the expense of one patent?—That might be beneficial, but it ought to be a clear improvement upon the first invention.

It might happen that a man would be very glad to have a patent for his improvement for a less period?—Certainly.

Do you know whether the low rate of fees in France, leads to many frivolous applications for patents?—I have not had experience enough to know that, but I apprehend there is a check to that by the commission, that it does not operate so there; the patent must be passed, I believe by a certain commmission, which is composed of scientific men.

Are you aware that in France, if a person who has obtained a patent, during the period he holds that patent, makes any improvement on it, he is obliged to give in a description of the improvement, in order to its being made known to the public?—I am not aware of that fact.

That is not the practice in this country?—No.

But would it not be useful that there should be some regulation of that sort?—I think some regulation of that sort would be very beneficial; I think many improvements are withheld from being published on account of the difficulty and expense of taking out a new patent.

Do you think it a fair thing to require from the patentee, that he should communicate to the public any improvement he may make during the period of his patent?—I think it is extremely fair, and that the public should have a right to require it.

Is it the practice in France, if a man takes out a patent, and neglects to carry his invention into effect within the period of a few years, that he loses his patent?—I do not know that.

Do you think in this country, it would be desirable that the patentee should be required to carry his invention into effect, or lose his patent within a limited period?—I should think it would; I think there is a provision to that effect, but I am not quite sure; I think the patent is good for nothing without it be carried into effect within a certain time.

Suppose a man taking out a patent for an invention, has not used his invention for five years, should not his patent be void at the end or five years?—He cannot be obliged to give up his invention; but certainly his patent ought to lapse unless it is produced in a given time.

At present there is no definite time?—No, I think not.

It would be desirable to fix the time then?—Yes. Do you conceive there would be a substantial benefit to the public by publishing a description of the patents taken out in the Gazette, a catalogue of them? I apprehend that they are well published at present; it is a matter individuals are glad to publish if the patents are worth any thing. I think they are most extensively published in periodical works which are devoted to the purpose, and I believe they find a sufficient sale and are more within the reach of those who want this kind of information than the Gazette itself would be.

It is a rule of law for patents not to be granted on abstract principles, is it not?—Yes, I understand so.

Do you conceive any inconvenience arises from that rule?—Yes, I think it is inconvenient. A person may not immediately have a technical mode of applying such principles; a prniciple may be applied in half a dozen different ways. I think it is very hard that from an imperfect plan a good principle should be lost.

At present persons taking out patents are desirous to include not only the principle of the method of invention they describe, but any other method that may arise from that principle?—Yes.

Do you conceive that is legal?—It has been so much discussed in courts of law that I can hardly be a competent judge of it; in some cases they seem to have determined one way and in others another.

Does not the prohibition to inventors to claim a patent on abstract principles, lead to an unnecessary multiplication of details in the specification?—Certainly, it leads to the use of words trying to embrace all sorts of things, which embarrasses the specification very much.

And is not the public, from the multiplication of details, really left in the dark as to what is the nature of the invention for which a patent is so claimed?—Very much so indeed.

Are not there many instances in which the only way of ascertaining whether a principle is discovered, would be by reducing it to practice?—There are some instances; but I think a principle may be sometimes clearly stated as applicable where an inventor has not at any rate practised it in the best way. In a case lately agitated of Mr. Crossley's, it was a method of measuring gas; it was a very ingenious one indeed; I think the patent was established; the principle was well detailed, but the particulars of the application were exceedingly difficult for persons not scientific to understand; it occupied the court a great deal of time, but the principle of the patent was quite clear to all scientific men.

Does it not often happen that these details are only introduced for the purpose of bewildering the reader, and not letting him know what the invention really is?—That has been so in some cases.

I think one of the rules is that there shall only be five persons named in a patent in this country?—Yes.

Is that an inconvenient one?—I think it is in many cases, because with only five persons, an inventor may not be able to raise a capital sufficient to carry his intention into effect, which might be done if a greater number of partners could be introduced to a share in the invention.

Does not that interfere with the rule?—I believe the rule is sometimes avoided by putting in names under licences or as trustees for others.

Are you aware of the ground upon which the rule is adopted of limiting the number?—No, I am not.

Are you acquainted with the expense of taking out a patent? —I think a patent for England, Scotland and Ireland, if not opposed before the Attorney General, and there is not much difficulty in it, will cost 450*l*. or 500*l*.

Is it the same expense, if a patent is taken out for the colonies?—Then I believe it may be more expensive; it would not be more than 500*l*.

Is the expense without reference to the nature of the invention?—Yes.

When a man wishes to take out a patent for Scotland or Ireland, or any other place, is greater time given to him to make out his specification than in England?—I am not aware of that; I believe there is.

You stated the usual time for putting in the specification to be two months.—Yes, two months.

Supposing a person wishes to take out a patent for Ireland, how soon would he be obliged to give in his specification for his patent; is longer time allowed than in England?—I do not exactly recollect the detail as to that.

But if there should be considerable delay in getting a patent in Ireland, it might happen that he would be obliged to specify in England before his patent, which had been taken out, could be received?—He would lose the patent then.

In that case, the object of an inventor might be frustrated in Ireland?—Yes.

Are you aware that has happened in any case?—No, I am not.

Would it not then be a great convenience, that a person should be able to take out a patent at once for the whole of the United Kingdom?—Certainly.

Is the person before whom the different patents are taken out in the three kingdoms the same, or do different persons grant them?—They are all taken out by the same agents, I believe.

Are the expenses nearly the same in Scotland and Ireland?—I think not; I do not recollect the proportion, but I believe the expense is considerably higher in one than the other.

Must you prove your case before the same person, if there should be any opposition, in one country as well as the other? —It is the Attorney General by whom the patents are granted; I do not recollect exactly the process, but I believe the inventor generally has little more to do than to pay the fees, and give the specification in.

Do you know what is the policy of allowing a person to take out a patent for an invention communicated by a foreigner and excluding him from taking out a patent for an invention communicated by a British subject?—No, only that it seems to depend upon the fact of publication; one bcomes a publication in England if it is a communication by an Englishman, it may then be supposed an Englishman knew it before; I know no other principle upon which it goes but that.

What is the policy of such a law?—There seems to be no policy in it at all.

Is it not often the case, when an Englishman wishes to sell an invention of his own to another person willing to take out a patent, that he first communicates it to a foreigner, who afterwards communicates it to the person wishing to become the patentee?—I think that is very likely to be the way, but I do not know any case of the sort myself.

If you were an inventor and could legally communicate it to a foreigner, and thus enable another person to become the patentee, is not that the course you would have recourse to if you wished to sell a patent?—I cannot say without recollecting the form of the oath.

If you could legally do so?—Certainly, if I did not violate good faith in doing it.

Do you not think it expedient that persons should be allowed to take out a patent, for a secret communicated to a person by another person, being a British subject?—Most clearly so; it may happen that a poor inventor may put into the hands of a richer man a good invention, which the richer man may take out a patent for, and work to the advantage of the public; but as the law now is, the person applying for a patent must swear he is the inventor, before he can take it out.

In that case patentees may very often perjure themselves?—I have not the least doubt of it.

Then you think the oath at present taken, is impolitic and unnecessary?—Yes, I do.

Does any inconvenience occur to you as being likely to arise from a person taking out a patent for an invention communicated by another?—None; the principle of the law as now applied is, that the publisher is the inventor, which seems contradictory to the spirit of the thing; I think also, that the mere invention is often of much less value to the public, than the bringing the invention into actual practice.

If secret patents were permitted, might not great hardships be inflicted upon other persons who might be expending their money in bringing to perfection some invention, for which it may afterwards be found a patent has been granted, that they should be excluded from practising that invention?—I think so, certainly.

The question presumes that the inventor is secretly perfecting his invention, without having knowledge of that invention for which a secret patent has been granted?—It would be injurious.

I think you have stated that titles of patents are generally so vague as not to inform the public what the nature of the invention for which the patent is taken out really is?—Generally so, I believe.

The object of making a title so vague is, to prevent the attention of the public from being drawn to the particular invention until the patent is sealed?—Certainly.

This inconvenience arises out of the law which vitiates a patent between the period of entering a caveat and the sealing of it, if any publication takes place?—Yes.

Have you any observations to make upon this subject beyond what you have stated?—Nothing has occurred to me, except the expense, which is one of the great objections to taking out a patent, and the great difficulty of maintaining it.

Is it not a fact that owing to the uncertain protection afforded by a patent, many inventors are deterred from resorting to it?—Many are so.

Are you of opinion the expense is so large, as to operate as an inconvenient check to the object of the patentee?—I think it is very often so, in the case of inventions of slight things which might be useful to the public; the expense is disproportionate to that of larger patents; the great evil is having to defend your patent in a court of law, if there is any infringement.

Supposing patents were made for different periods at different prices, do you conceive if certain prices were to be affixed on patents and a period of fourteen years allowed for an important patent, would that be too large a period, or do you not think that it is necessary the expense should be to a certain amount in order to check frivolous application?—The expense ought in a great measure to depend upon the nature of the patent:

Do you not conceive the present expense is necessary in order to check frivolous applications?—I do not think it necessary nor does it seem to check it. I do not think the expense is so objectionable as the uncertainty of the law

When an infringement of a patent takes place, what is the mode pursued by the patentee of preventing that infringement continuing; is it by an application to the Court of Chancery for an injunction?—Yes, in the first place, but the injunction is always dissolved upon the application of the other party to try it, and the defence of a patent is one of the most expensive kinds of defences on account of the kind of witnesses that are generally necessary; it has become the fashion of late to subpœna a number of eminent scientific men, some perhaps brought from a great distance. The expense of defending a patent has now become enormously great.

Do you see any reason to doubt that it is good policy to allow any person who applies, to question the validity of a patent?—I think every one should be allowed to question a patent if he sees there is reason to doubt of its validity; this however of course leads at once to litigation.

What other mode is there of trying the validity of a patent, except by allowing a person who applies to infringe it?—I think it is good policy to allow any body to attack a patent if the means of defence were not so uncommonly burdensome. I think it ought to be open to attack.

Have you any suggestion to offer for the purpose of reducing the expense?—I could hardly venture to suggest any; my attention has been so little directed to the subject, and I cannot exactly say what it should be; something might be devised if a commission was appointed which might avoid what is now very burdensome, the mode of trial to protect a patent; it is now absolutely necessary to call a great number of witnesses to prove a patent at a great expense,

There is no mode of defending your patent except by constant vigilance?—No.

Patentees do not bring actions against every person who infringe their patents?—No, they could not.

Can you devise any other mode of defending a patent except by witnesses before a jury?—Unless it can be brought to some other mode of contesting it at a less expense.

Questions on patents are sometimes tried by special juries; do you know whether any inconvenience arises from that sort of tribunal?—It is difficult to get counsel to explain a case properly to the jury, and to get their attention excited to such inquiry: it is very difficult to explain, even to gentlemen who have more attended to this kind of subject, and requires most expensive models to be made; it is very often exceeding difficult to make even the Judge understand.

Do you not think it would be better if a commission could be formed of scientific men, who are accustomed to the thing; that it would be a much cheaper and much better mode?—I think it would be a better mode, as it would avoid all that immense train of scientific witnesses, often conflicting with each other, which adds so much to the expense.

Do you think that a tribunal of scientfic persons would be a purer tribunal than that composed of persons indiscriminately chosen?—I do not think it would be a purer tribunal, but I think it would be as good a tribunal, and might be much cheaper.

Do you not think it would be much purer, and more competent?—I think it would be as pure.

Supposing a commission was deemed advisable to be formed of scientific persons, do you imagine confidence could be placed in such a tribunal, for the purpose of deciding disputes of patents? —I dare say there would be jealousy; I think that would be one of the inconveniences of it; I do not mean to say a commission would be quite satisfactory.

Can you state any other mode which would be more advisable? —No, I cannot,

Do you think there would be more inconvenience from the jealousy it might occasion, than from the present incompetent sort of tribunal?—I think not; avoiding the expense would be a great thing; upon the whole, balancing the evil, a commission might be the better thing.

If a commission was appointed, must there be a commission for each case separately?—I should think there must; a commission might be something in the way of arbitration.

Do you think, if such a commission was established, people would object to a small addition being made to the expense of a patent, taking the benefit of the commission, which would be kept I apprehend at a small expense?—I should think not, if the patentee could avoid the chance of litigation.

You think not, if he avoided the expensive mode of proceeding to a court?—No, the expense of a court is frequently most enormous.

Do you not imagine in consequence of the expense and difficulty of defending patents, that there are successful attempts at infringement in many cases?—I should think so; the case of the Kaleidescope for instance, it would have been quite impossible to have defended that patent; they must have brought five hundred actions,

Are you acquainted with any case where a person's patent has been infringed, who has abstained from defending his patent?—I do not recollect hearing of any, but I have no doubt that is very often the case.

Would not one objection to a standing commission be, that it would require such varied knowledge as you can hardly expect to meet with in a limited number of individuals?—I think it would; if there was any commission, the structure of it should be arbitration, rather than a standing commission.

Benjamin Rotch, Esq., further examined.

Your objection to the present law is, that some Judges would hold that an inventor is not entitled to maintain a principal exclusively?—Three I know would hold the contrary. I was for the defendant, and I said, if a certain Judge tries it, we shall succeed as a matter of course; if another tries it, we shall lose it: that is a terribly uncertain state to have the law in. I believe I have exhausted the subject of the fifth recommendation as to the statute; my object is to show the necessity of having the Law of Patents altered to meet the circumstances of the present era of inventions, which the old law does not; there being at least nine patents out of ten which will not, strictly speaking, come under the present statute of monoplies. The next subject on which patents are upset is for want of novelty; that is also a very important subject, and one which, if it could only be secured to patentees, would be of the greatest possible importance to them; it is not possible for any man to know what has been done before twenty or thirty years or forty years ago. The statute, for I cling greatly to the statute, inasmuch as I know statesmen are very unwilling to make new laws where the old ones they think suffice (I think the old law does suffice), that it was wise and good, but that the Judges have completely perverted it in the present day; with regard to that, instead of altering the law, I would only wish them brought back to the very letter of the law; the words of the statute are with regard to novelty, because it is necessary an invention should be new; the statute says, "the first inventor of such manufactures, which others at the time of making such letters patent shall not use," in the present tense. Now it very often happens (I am speaking now from an experience of fifteen years) that this does constantly happen, namely, that a person (I will say ten years ago) invents a machine, which, for want of just exactly the right thing, which is of the most importance, does not act; he tries it; it is a complete failure; the thing is thrown by; some eight or ten years afterwards every body (I will say it is an invention for spinning), every body is trying who can save an hour in the spinning of cotton; it is likely a second person may invent the same thing, or may catch at the same principle; he adopts a different mode of carrying it into effect, and being a little more clever than the other, he hits on the point the other wanted, and makes his a most valuable invention; he takes out his patent for it; away comes the other man, who ten years ago invented something that involved some few of the parts this new invention does; he says, "I made such and such wheels, and put them together for the same purpose ten years ago; I did this much of it," and that patent is upset; and my experience teaches me another thing, which is a still greater hardship, arising out of the same circumstances, which is, that if a clothier in the west of England has a patent, one single man is called from the north of England, who comes down into court, and having read the man's specification, stands up like a parrot, and will be found to swear, fourteen or twenty years ago I did so and so, and so and so, exactly verbatim repeating the specification; the patent is upset; nobody can provide against such evidence as that; and I do not hesitate to say, there is more perjury in that one particular (and I am sure I shall be held out by a member of the Committee, who I see on my right) than could be believed by a Committee who have not experienced what we have. That arises from two causes; first, because they do not adhere to the statute, which I think a very wise one; and secondly, the perjury that interested people are enabled to procure by suborning witnesses, which is of common occurrence. It is always the interest of the whole trade againt the patentee combined; they combine their money in the first place, and then fight away and procure witnesses at any price.

You mention this arises from not adhering closely to the statute?—The statute confines the novelty to such manufactures as others at the time of making such letters patent shall not use. Now I apprehend, if it was clearly understood, that if a thing, from any circumstance whatever, has gone out of use, the man, provided he be also the inventor, though not the first inventor, who introduces it in such a form again as shall make it an object to be very much desired indeed, is entitled to his patent; if it is not an object of that value, where is the harm of granting him the patent if he makes nothing of it? if it is not in use, there is no vested interest to be injured by granting it; and if he has produced it in a more efficient form than the other, he is entitled to a patent; it is not like the case of a man who takes out a patent for an article which is in use, and another invents a little improvement on it; that would be a hard case. But I am supposing the original invention has utterly failed, is laid by and forgotten, and is not of use, then the man who invents it a second time, and brings it forward in a form that makes it useable, I should conceive is entitled to a patent; it is also impossible, as a point of evidence, for any man to ever meet that one point of novelty; supposing it is a cloth patent; counsel say "yes, I think your specification is good; I think your title is good; you have clearly proved the infringement; but some fellow or other will come and say he has used it before, and you are done—are you sure they will not do that?" the reply is "they cannot; I must have known it; all the trade must have known it; all the clothiers and tailors in London come forward and say we have not known of such a thing; it is invaluable, it makes the cloth worth two shillings a yard more: it must have been known if it had been adopted." A man out of Yorkshire comes and simply swears, "I made a piece of cloth in that way;" "who did you sell it to? cannot tell." "Did you make more? cannot recollect, but I did that;" and he sticks to it, and you cannot get over it. The patent I allude to was upset, and a most valuable one it was.

Does the difficulty of rebutting that arise from the length of time?—Yes, they take care to go far enough back; ten years ago or twelve years ago; how can people get evidence in a country, about a spot, and connected with people that he never heard of up to the time of coming into court? the Judge directs them, the Judge says, (we have the case in point of the lustre for our coats, which was upset; an immense fortune was to be made by it; the party was receiving many thousands a year regularly for the patent; it was upset exactly in that way. I asked the question, could a jury believe such a thing) the Judge said, "you must believe it, they have no evidence on the other side; this man swears distinctly he did it; no man can know as well as himself; if he swears he did it, it will be on his own head if he tells a lie." The Judge tells the jury, "you must upset the patent," and they do it; it constantly happens. I should conceive that the meaning of the Act clearly was, that if at the time it was not in use, and thereby throwing only the *onus* on the individual, the patentee, to discover that at the time the thing is not in use; that the public are not injured because they are not making use of that invention, and therefore granting a monopoly enables them to make use of it, because a man can always allow the public to use his patent; he may always grant licences, the public may have it again, and nobody is injured if it is not in use at the time. I should consider, adhering to the statute strictly in that particular would be the best possible criterion they could have. Even if they thought it necessary to go a little further; limit it within two years; if it shall not have been in use within, say five years, there is some chance of a man getting evidence within five years; but twenty-five or thirty, as I have known, you cannot possibly trace counter evidence to upset it: if a man says I sold it to such a house, the house is gone, partners dead, and broken up. I should say the best thing would be to revert to the present statute, and say "which others at the time of making such letters patent shall not use."

Does it not use the words 'first inventor'?—True, it does, and we must endeavour to explain and reconcile any thing like inconsistency. I would have it suffice that he should be the inventor, though not the first inventor; and as to novelty, that the words of the statute should be adhered to, namely, that it should be sufficient for him to prove, in order to establish its novelty, that "others at the time of making such letters patent did not use it."

Are the Committee to understand you would grant a patent for the revival of an old invention?—If it be really to a second inventor of the thing, provided it has gone out of use entirely.

How would you prove that he is an inventor?—In the same manner as heretofore; a man makes affidavit of that before he can get his patent; we know unfortunately, as practitioners, a vast number of affidavits are sworn as to the first inventor and the true inventor, which are utterly false; we cannot have greater security than we have now.

Would that affidavit be sufficient in a court of law?—No, a patent is always liable to be upset on this ground; and you would have the same security on that score that you have now.

You mean, at any rate, that he must be an inventor?—I distinctly wish he should be inventor.

Would it not leave it open to a great difficulty of proof where the question is whether the matter is the produce of his own breast, and there is proof that it has been invented before, although not used?—There is great difficulty in that certainly; my answer to that is this, however; the same difficulty exists now, and the same provision which in all like cases is afforded by the law, would exist then; that as far as regards the proof of invention, a mere *prima facie* case is enough; if you get a friend to come forward and say—"You are acquainted with cloths?—Yes. You are a draper, did you ever see these lustre cloths before?—Never. Is it likely you would if there had been any?—I think I must." That would be held to be proof enough in the first instance.

Does not that illustrate the difficulty?—did you ever see it before?—No, I never did; if he said he had seen it before, that would destroy the case; so it would now.

At this moment, if you attempted to upset a patent, you must prove it has been used before?—The hardship at present is, all the world and trade are against the patentee; they bring one individual to swear, he having the means before him in the man's specification, I did so-and-so; he upsets the patent. We see constantly this evidence is suborned for this particular purpose. The patentee has paid a large sum to government for his patent; he has induced perhaps somebody else to pay a still larger, and he is always liable to this difficulty, of some individual coming and saying that he did it before, whether true or false; it is too easy a proof; that is a very crying evil to patentees; if an individual who came to make that false oath, felt that it was necessary to swear to facts within five years, or within any time that it could be probable other persons could be got at to contradict him, he would not feel safe, and it would be a great check upon the evil.

Would it not be necessary that it should be publicly used?—That is the case at present. In all other countries, except England, if an invention is not put in practice within two years, he loses it.

Would it not be expedient to allow five years, in consideration of cases in which the first inventor may fail in one or two attempts; and may, after the lapse of three or four years, be able to carry his invention into effect?—Upon the whole I think it would be better that a period of five years should be allowed.

Is it not the case in France, if you do not carry your invention into effect in two years, that any other person may take out the same patent?—Yes, that is so; but it could not occur in this country; in France the specifications are sealed, and therefore the inrolment of the specification does not publish the invention; but in this country the moment it is inrolled it is published.

Is it the practice that all the specifications should be sealed?—Yes.

Or only on application?—They are all sealed as a matter of course there.

And are they not open to the public?—No; except on special applications. Those patents that I have now named show the uncertainty of the Judges as to the determination of the meaning of the word 'manufactures,' and is the subject on which one half the patents are almost upset; a quarter of them, or more than a quarter of the remaining half are upset on the score of novelty; and those are the only points which I have to communicate to the Committee with respect to the specifications of patents, and the uncertainty of the law of patents, as connected with the specifications; but I still adhere to my original position, that it is of the utmost importance to make the patent law certain; and it would, threefold, increase the revenue on that head to the government; because it is the uncertainty of patents that renders people unwilling to enter into them: that leads me to another point of uncertainty; not with regard to the specification, but having a reference certainly to novelty: it is a point which depends entirely on that over which the patentee has no control, but over which the government has entire control, and by which the patentee suffers most cruelly. When a man makes his affidavit that he is the first inventor, and petitions for his patent, he does it by giving a title, as it is called, to his patent:—he says, "It is an improved paddle-wheel." He gives his name and address, so-and-so; petitions for a new paddle-wheel; he puts in his affidavit; he puts in a petition; it is published in all the journals, a man is applying for a patent for such an object, and so on; the man's name is given; I have known a man fifteen months after presenting his petition and affidavit before he could get his patent passed through the offices. Now a man cannot apply for his patent until he has made some sort of experiment; his workmen are acquainted with his experiment, and if during any portion of that period any of his workmen betray him, or any man through intrigue can get hold of what he is about, that individual may apply for a patent too; or if he has a spite against him, he may make it public, and make use of it, and thereby throw the inventor out of his patent. The patentee goes to a great expense, he has no control over the time it takes to pass this patent through the public offices; and it is granted to him with that heavy expense on his back at a time when he can make no use of it. A man cannot take out a patent without stating what it definitively is, because he is obliged to swear he believes it will be useful; he cannot do that without making experiments, and the making of those experiments makes him liable to be betrayed, which sometimes, as I said before, may be done through a whole space of from three to fifteen months; sometimes His Majesty is ill, it requires two signs manual from the King. There are other reasons why these things are delayed at other times, and this delay is, perhaps, one of the most cruel things to a patentee that can be; he cannot provide against it; he cannot hasten the thing, and he must put himself in the power of others for his patent. The remedy I would propose for that is, that when he presents his petition for his patent, he should deposit the whole amount of fees required for a patent, (which is not the case now, because he may pay as they go through the offices, and he may stop at any moment he pleases and not complete it); and in that return for this deposit (however long the offices may be in passing his papers through them, and granting his patent), when the patent is granted it should bear even date with his petition; that it should relate back; that he should have fourteen years from the date of his petition. The passing of a patent is a thing that might be done in three days if there was any dispatch of business, and if it was not waiting for those several signs manual, which must be dependent constantly on circumstances; but it does seem extremely cruel that the patentee, who is called on to pay an immense sum of money, who does all he can, should present his petition to-day, and not have his patent for six months, during which time the secret of his patent is frequently discovered. A man had a patent the other day for a railway; he said I cannot try it in my parlour, it must be a public experiment; if I try it now it will be six months before I can get my patent; what a condition I am now in; every body will know it, they will be adopting it, and laughing at me. I do not see there can be the slightest objection to date the patent back to the date of the petition, provided government is secured by having the deposit of the whole amount of fees, so that a man cannot retract and not go on with the patent.

By which you mean, he should be secured from the time of the petition?—Yes.

Would not that enable him to thrust in his specification any invention that he might learn in the mean time, between the time of presenting the petition and the time it is sealed; he may have five or six months; inventions may be made by others which he may hear of, and may he not thrust in under the same title those inventions?—That evil now exists in a ten-fold degree to what is imagined or is stated, and arising out of a much greater evil which I am now going to state, and which always exists on the present system; the man has the opportunity of getting other people's inventions; but I will show he has it to an extent which I would wish to curtail; I will state the course the thing takes; a man applies for a patent, he is told at the Patent Office, if you say, "I mean to take this out for England;" you will only have two months to specify; but if you will say, you intend to take it out for Scotland and Ireland, it does not bind you to do so; but you will have six months before you are bound to specify your patent; well some man has heard that I am going to take out a patent for something, and he has heard the general terms, and he immediately goes and makes an affidavit he has invented the very thing perhaps; takes my general title, which he can see by paying a shilling at the Patent Office; he takes out a patent, and says, "I mean to take it out for Scotland and Ireland;" and he gets six months before he is bound to detail what his invention is. I know nothing of this; he comes a month after me; I am an honest man; I have no intention of taking out a patent for Ireland and Scotland, when I am told, "if you like to say so, you will have six months; I cannot say so; then you can only have two months; be it so." I am bound to specify when only half the second man's time has run out. I am obliged to specify mine at the end of two months; and I have known instances of a rogue immediately afterwards copying my specification verbatim into his own, for which he has six months to specify, and therefore he can do it. It is a trick that is played and is constantly done in a minor degree; but I have known the full extent of what I have now stated done by a party; and that is a very great evil; but why do they want time to specify? because they dare not make a single experiment before the patent is granted; and when a man makes an affidavit, and swears he believes it will be useful, he has no idea whether it will or not, no more than the man in the moon; he says, "I must get my patent, and then I will make my experiment;" when he gets his patent, he says, "I will employ workmen, I have two months, and I will make my experiments;" he has not time perhaps to make sufficient experiments in two months, and he specifies it imperfectly; because he has been afraid to do any thing beforehand, having no means to secure himself. What I should propose would be, no man should be allowed more than two months; I should also state, that this is only a sort of misuser of the original intention; it was intended a man should have two months for each country; two months from the date of his Scotch patent to specify his Scotch; two months from the date of his Irish to specify the Irish, and two to specify the English; they now give six months to specify the whole by an amalgamation, which is a complete misuse of the intention.

The remedy you suggest would be a sort of palliative, by keeping the title secret?—No; but no man should have more than two months, so that every body should have the same time at any rate, thereby allowing a man to be secure the moment he enters his petition; then one man cannot get the advantage of the other. I have have known one man upset another because he had the ear, I will not name names, of a person about His Majesty, who could get his paper signed; and I have known one hundred guineas given for signing one paper before another.

Would you oblige him to describe the principle more fully in his title or petition than he does at present?—Most certainly, in return for the security.

Would it not be necessary to make the arrangement of taking the three patents out very different, if you altered the six months at present existing; inasmuch as the time for receiving the different patents from the countries deviates so much, that otherwise your specification would be sometimes nearly due for the English, before your patent was even secured for Scotland or for Ireland? —There is no need to make any proposition for that; I would wish the original intention should be carried into effect; that it should be two months for each country; it is your own fault if you do not choose to take it out for each at the same time; you may do it; if not, you will be allowed two months for Scotland, and two months for Ireland, but not by uniting them all in one affidavit, get six months for any one.

Then would not this difficulty arise, you may have specified for England before your patent is sealed for Ireland, and thereby have betrayed the whole of it completely, so that your Scotch patent would be good for nothing?—Not if you have petitioned at the same time; these are all provisions supposing the patent bears date from the petition.

Is there not a convenience now in allowing a discretion in the Attorney General to give time for specifying?—I was just coming to that; but I wish to refer to a question just put with regard to a person giving a more full description than contained in his title, which is a most important point; and in order to show how important a point it is, I am very often obliged as a barrister, when I find I have a rogue to deal with, to say, "we must have a petition before the Attorney General;" to use our cant phrase, "we must cook up a petition before the Attorney General;" why so? because then it is often made one of the conditions. At any rate counsel who understand it, can get it made one of the conditions, that if a patent has been granted at all like mine, or for the same subject, I who come afterwards, have shorter time to specify, can make him give a fuller description of his invention than is contained in his title which is left sealed up in the Attorney General's office, and afterwards his specification, his amplified specification, must correspond with that more detailed title. That is of great importance, if that could be carried a little further, and if that advantage was not unfortunately confined to the very worst tribunal that perhaps ever sat to judge of any thing, which is the tribunal before the Attorney General. I am sure I do not say it with the slightest reference to any individual, but merely to the office, which from its nature must vary. I have known the most competent men in England, both as mechanists, lawyers and chemists, Attorney Generals, and the gentlemen who now fill those offices have had great experience in those sciences, but I have known those appointments filled by men the least qualified as mechanists and chemists; and a man must not only be a lawyer, but he ought to be all three, to decide at that tribunal. That is a subject I will come to afterwards, but as at that tribunal one good thing is effected, it forms a precedent for introducing it into the Act; it is done before the Attorney General; why not, as a return for the boon you get in having your patent dated previously, why not give a more full description in the petition? it would prevent an immensity of fraud if it were so.

Would you propose that the Attorney General should have an assessor?—I am doubtful what would be the best thing to do, whether to appoint an assessor or a commissioner. If it were a commissioner not appointed by the Attorney General, the public would be much more likely to be well served, than by an asses-

or appointed by an Attorney General, who would be removable with each Attorney General, any Attorney General would appoint any assessor. I am excessively averse to commissioners myself in patents; I think the public would be ill served indeed, by having a commissioner to inspect specifications; but I think in the case of the Attorney General, such gross injustice is done so unwittingly —this applies merely to the situation of things, not to individuals,—but I have seen such gross injustice done at the Attorney General's office for want of that particular knowledge—it is not one Attorney General in twenty has that mechanical knowledge, I will say grovelling knowledge for him which is required; it must be quite mechanical and chemical knowledge—I have seen great injustice; there is about twelve pounds charged at each opposition to the parties. The Committee is not aware, perhaps, when a man takes out a patent, his petition lies at the Attorney General's office for a week, and every body who has a caveat entered on the same subject, is written to and told, "such a man is going to take out a patent on the subject you have a caveat for; is it your intention to oppose him?" That gives every body an opportunity to do so; and it is commonly the practice, and it is generally my advice, arising out of circumstances, to oppose by all means; ten chances to one a mechanic puts questions which the Attorney General does not see the bearing of, and you have a great chance to find out what it is before you leave him; that occurs from the want of that knowledge which it is not necessary an Attorney General should have for any other purpose, and which very few have. There is no appeal from that tribunal, because if I apply for a patent, and another opposes me, and he says he has used something like it some years ago, and he shows it to the Attorney General behind my back—for he receives each party privately, —he then comes out of the room; I go in, and state what my patent is; the Attorney General says, "I cannot give you a patent for this, because it is in use already." I say, "tell me what it is—Oh, no!" you are entirely at the mercy of the Attorney General. If a man has dressed up any thing that looks like it, or which the Attorney General in the want of mechanical knowledge, thinks like it, he determines at once you cannot have your patent; he will not report to the King it is a proper subject to have the patent granted for, and you have no appeal whatever from his decision; that of itself shows the necessity of having a a competent person to judge of the similitude of the inventions. I should say a commissioner would be better than an assessor.

But if you propose it to be secured when you first put in your petition, could you limit at all the time of a dispute before that or any other tribunal?—Of course, not. I should say, it would be far better not to have any such limit, provided none of those difficulties which I have mentioned were thrown in the way of a man.

Mr. John Macarthy, called in; and Examined.

HAVE you any suggestion to offer with regard to the laws relating to patents?—With reference to the price of patents, I think it is too high. To a man like myself, an officer on half-pay, and having a family, it is a very heavy expense; and I beg to say, with reference to the specification, that in all the patents I have taken out, of which I have had as many as four, I have always taken care to have six months, but in more instances than one, I have known six months not sufficient time. I have been obliged to specify before the matter has been ripe; but at the same time I believe there are many inventions that would allow a patentee to inrol his specification almost the next day. I want at this moment to take out a patent with reference to a shoe for an elephant in India, but I must traverse by proxy to India before I can specify. I have heard that it has been proposed that there should be a Board to sit upon inventions. I believe it is the practice in Russia, but it is productive of a great deal of mischief to inventors; inventions are often brought before them, with respect to which they are not competent judges whether they are good or not, and they are often in consequence thrown out; an invention may appear a very silly thing, but at the same time it may turn out a very profitable thing, and there may be a very valuable invention that may perhaps come to no good.

Supposing there were a Board appointed, not composed of lawyers, but of scientific men, and that their attention was to be directed not so much to the usefulness of the invention as to the sufficiency of the description, should you have any objection to a Board of that sort?—No.

(To be continued in our next.)

New Patents Sealed in 1830.

To John Braithwaite and John Ericsson, of the New Road, in the county of Middlesex, engineers, for their having invented or found out an improved method of manufacturing salt. Sealed 27th Feb.—2 months, for inrolment.

Enoch William Rudder and Robert Martineau, of Birmingham, in the county of Warwick, cock-founders, for their having invented certain improvements in cocks for drawing off liquids. 27th Feb.—6 months.

To Charles Random Baron de Berenger, of Target Cottage, Kentish Town, in the parish of St. Pancras, in the county of Middlesex, for his having invented improvements in fire arms and in certain other weapons of defence. 27th Feb.—6 months.

To William Grisenthwaite, of Nottingham, Esq. for his having invented an improved method of facilitating the draft or propulsion or both, of wheeled carriages. 27th Feb.—6 months.

To Henry Hurst, of Leeds, in the county of York, clothier, for his having invented certain improvements in manufacturing woollen cloth. 27th Feb.—6 months.

To Moses Poole, of Lincoln's Inn, gentleman, in consequence of a communication made to him by a certain foreigner residing abroad, for a certain combination of or improvements in springs, applicable to carriages and other purposes. 27th Feb.—2 months.

To Joseph Chesseborough, dyer, of Manchester, in the county of Lancaster, patent card-manufacturer, in consequence of improvements by himself and communications made to him by a certain foreigner residing abroad, of which he is in possession, for certain improvements on and additions to machines or machinery to be used and applied for conducting to and winding upon spools, bobbins or barrels, rovings of cotton flax, wool or other fibrous substances of the like nature. 27th Feb.—6 months.

To William Grisenthwaite, of Nottingham, esq. for his having invented certain improvements in steam engines. 27th Feb.—6 months.

To Robert William Sievier, of Southampton Row, Russell Square, in the parish of St. George, Bloomsbury, in the county of Middlesex, sculptor, for his having invented certain improvements in the construction of rudders for navigating vessels. 27th Feb.—6 months.

To Simon Thompson, of Great Yarmouth, in the county of Norfolk, mariner's compass maker, for his having invented or found out certain improvements in piano-fortes. 27th Feb.—6 months.

To William Howard, of Rotherhithe, in the county of Surrey, iron manufacturer, being one of the people called Quakers, for his having invented certain improvements in the construction of wheels for carriages. 27th Feb.—6 months.

To Philip Chilwell De da Garde, of the city of Exeter, gentleman, for his having invented certain improvements in apparatus for fidding and unfidding masts, and in masting and rigging of vessels. 27th Feb.—6 months.

Thomas Prosser, of the city of Worcester, architect for his having invented or found out certain improvements in the construction of window sashes, and in the mode of hanging the same. 6th March.—6 months.

To Thomas Richard Guppy, of the city of Bristol, sugar refiner, for his having invented a new apparatus for granulating sugar. 6th March.—6 months.

To Ralph Stevenson, of Colridge, Stafford, potter, for his having invented improvements in machinery for making from clay or other suitable materials, quarries, bricks, tiles and other articles. 6th March.—6 months.

To James Ramsay and Andrew Ramsay, both of Greenoch, in North Britain, cordage and sail cloth-manufacturers, and Matthew Orr, of Greenoch aforesaid, sail maker, for their having invented or found out an improvement in the manufacture of canvas and sail cloth for the making of sails. 20th March.—6 months.

To George Scott, of Water Lane, in the city of London, engineer, for his having invented certain improvements on or additions to windlasses, and relative machinery applicable to naval purposes. 20th March.—6 months.

To John Alexander Fulton, of Lawrence Poultney Lane, Cannon Street, in the city of London, merchant for his having invented an improvement in the preparation of pepper. 20th March.—6 months.

To William Erskine Cochrane, Esq. of Regent Street, in the county of Middlesex, for his having invented an improvement or improvements on his patent cooking apparatus. 20th March.—6 months.

To Benjamin Rotch, of Furnivals Inn, in the county of Middlesex, barrister at law, for his having invented or found out improved guards or protections for horses legs and feet under certain circumstances. 20th March.—12 months.

CELESTIAL PHENOMENA, FOR MARCH, 1830.

D.	H.	M.	S.	
1	0	0	0	Clock before the ⊙ 4 *m* 4 Sec.
2	21	0	0	☽ in conj. with ξ in Leo.
5	0	0	0	Clock before the ⊙ 2 *m* 52 Sec.
5	9	0	0	☽ in conj. with τ in Leo.
5	21	0	0	☽ in conj. with β in Virgo.
6	21	0	0	☽ in conj. with η in Virgo.
7	0	0	0	☽ in conj. with 1 γ in Virgo.
7	15	0	0	☽ in conj. with δ in Virgo.
7	19	29	0	Eclipt. opposition, or ○ full moon.
9	0	0	0	☾ in conj. with κ in Virgo.
10	0	0	0	Clock before the ⊙ 1 *m* 25 Sec.
10	18	0	0	☾ in conj. with γ in Libra.
11	21	0	0	☾ in conj. with φ in Oph.
13	0	0	0	♄ Stationary.
14	17	0	0	☿ in conj. with 1 ζ in Pisces.
15	0	0	0	Clock before the ⊙ 5 sec.
15	18	49	0	☾ in ▭ last quarter.
16	5	0	0	☾ in conj. with 2 β in Capri.
18	8	0	0	☾ in conj. with δ in Aquarus.
18	22	0	0	☿ in conj. with ο in Pisces.
18	23	0	0	☾ in conj. with λ in Aquarus.
20	0	0	0	⊙ before the Clock 1 *m* 5 sec.
20	8	0	0	⊙ enters Taurus.
22	11	27	0	Ecliptic conj. or ● new moon.
24	13	0	0	☽ in conj. with γ in Taurus.
24	14	0	0	☽ in conj. with 1 θ in Taurus.
24	15	0	0	☽ in conj. with 2 θ in Taurus.
24	20	0	0	☽ in conj. with α in Taurus.
25	0	0	0	⊙ before the clock 2 *m* 5 sec.
26	17	0	0	♂ in conj. with ♅ long. 9° in Capri.
				♂ Lat. 1' 27 S ♅ Lat. 37 S Diff. of Lat. 50.
28	13	0	0	♂ in conj. with ♀ in Capri.
29	7	54	0	☽ in ▭ first quarter.
29	15	0	0	☿ in conj. with δ in Aries.
30	0	0	0	⊙ before the Clock 2 *m* 53 Sec.
30	3	0	0	☽ in conj. with ξ in Leo.

☽ the waxing moon.—☾ the waning moon

Rotherhithe. J. LEWTHWAITE.

METEOROLOGICAL JOURNAL, FOR JAN. FEB. AND MARCH, 1830.

1830.	Therm Hig.	Therm Low	Barometer. High.	Barometer. Low.	Rain in inches
JAN.					
26	38	29	30,25	30,11	
27	35	29	29,86	29,74	
28	36	29	30,10	29,93	,375
29	37	29	30,13	30,11	,075
30	37	23	29,92	29,81	
31	23	15,5	30,06	29,98	,125
FEB.					
1	25	15	29,86	29,76	
2	21	15	29,75	29,7[illegible]	
3	23	14	29,82	29,76	
4	31	12	29,82	29,70	
5	25	11,5	29,66	29,64	
6	25	2	29,56	29,54	
7	42	14	29,42	29,39	
8	45	39	29,62	29,39	,05
9	43	34	29,55	29,36	,5
10	41	28	29,96	29,69	,075
11	41	23	30,09	30,06	
12	42	30	30,06	Stat.	
13	39	26	30,07	30,06	
14	38	24	30,02	Stat.	
15	40	28	30,26	30,20	
16	35	25	30,26	30,16	
17	35	23	29,96	29,72	
18	36	26	29,67	29,61	
19	38	24	29,74	29,67	
20	38	21	29,89	29,75	
21	43	20,5	29,60	29,40	
22	38	24,5	29,76	29,61	,425
23	54	28	29,83	29,60	,225
24	56	43	30,00	29,88	,025
25	55	43	30,11	30,02	
26	54	43	30,02	29,89	,175
27	56	43	30,00	29,96	,075
28	55	41	30,08	29,94	
MAR.					
1	53	38	30,31	30,23	
2	55	42	30,33	30,32	
3	55	39	30,33	30,30	
4	43	24	30,16	30,00	
5	46	26	29,94	29,92	
6	52	26	29,96	29,95	
7	40	25	29,99	29,93	
8	47	26	29,99	29,88	
9	47	35	29,66	29,54	,125
10	50	37	29,66	29,55	,025
11	56	40	29,84	29,60	
12	55	38	30,03	29,66	
13	51	35	30,24	30,10	
14	52	30	30,13	29,82	
15	50	32	29,48	29,36	
16	48	30	29,74	29,53	
17	61	33	29,94	29,71	
18	56	34	30,16	30,03	
19	55	48	30,19	30,12	0,75
20	56	37	30,09	30,04	
21	57	32	30,26	30,19	
22	50	37	30,13	29,86	
23	53	31	29,98	29,95	
24	57	43	30,10	30,01	
25	65	33	30,33	30,24	

THE

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No. XXVI.

[SECOND SERIES.]

Original Communications.

ART. II.—ON THE REPORT OF THE PATENT-LAW COMMITTEE.

To the Editors of the London Journal of Arts, &c.

GENTLEMEN,—After routing an enemy in a main battle, it is good generalship to destroy in detail the corps which composed his army. This politic course I will pursue in respect of the several forms, documents and warrants, which constitute the process of taking out patents under the seals. I have, I trust, fully vindicated the right of every individual to protection to his invention, as a matter of *inherent property*, and beaten down by the evidence before the Committee, and rational deductions, the fallacious arguments of those who would support the present system of enormous fees for the protection of the inventor.

I will still keep to the evidence as published, and draw conclusions from it in proving the absurdity, evil, and inutility of the *separate* documents, &c. (with scarcely an exception) which form the detail upon which the mass of extravagant and oppressive fees are demanded.

As the entering of a *caveat* which entitles an inventor intending to take out a patent, to notice of other similar inventions is entirely optional with him to do or not, as he may be advised by his professional agent—I have only a few observations to make upon this form.

" The caveat in general, is no protection whatever. If the person entering a caveat, require to have notice of a patent being passed, that caveat will give him notice." Mr. I. Farey, Rep. pp. 22 and 23.

" In case an applicant for a patent was aware that some one else had turned his mind to the same subject, would it not be of service to that person to lodge a caveat, &c.?" " That is the common case of a caveat being lodged, but it can do no great good in most instances. If a new invention is getting up with so much secrecy that none of the rivals are informed of its existence, then a caveat has only the effect of calling attention to the subject; but if the attention has been already called to the subject by other means, then a caveat has the effect of procuring a notice of any rival application" (p. 22.) In this view most of the practical men agree. Mr. M. Poole recommends them to be continued for all the fourteen years, in order to prevent others taking the patent for the same object." p. 84. The charge is, I believe 1*l.* 1*s.* per annum, but there is generally sufficient service done for that sum, by the notices sent to the parties, although the advantage of entering a caveat appears very questionable. It is by the *oppositions* raised upon the caveat and otherwise, that the *fees* pour into the Attorney-General. This fruitful source of emolument, and the general incapacity of an Attorney or Solicitor-General to determine upon scientific inventions, deserve a more particular notice. " It sometimes happens in order to make the subject intelligible to the Attorney General, that a good deal of expense (in model or plans) must be gone into." M. J. Taylor, Rep. p. 6. Mr. Farey says, p. 23. " It requires a very deep knowledge to form a decision between the merits of the respective inventions. The Attorney General almost always sees sufficient ground of new invention to grant the patent or both, if two are applied for; therefore opposition becomes of no effect." "So that it is a mere formality? Yes."

Mr. F. Abbott, whose opinions and information are generally valuable, has rather a predilection for retaining the adjudication of opposed inventions to the Attorney General. "I would say, it does not often happen that there is any difficulty that the Attorney General cannot decide."—Rep. p. 58.

And yet upon the subject "of appointing a Commission, of scientific men to examine the specification, in order to ascertain whether the thing was properly described or not," Mr. A. says—"I doubt the practicability of it, the vast matter that must come before them that they cannot be competent, any three men, to decide on every thing that must come before them." How an Attorney General, the pursuits of whose previous life, can have brought scientific matters before him, only occasionally, should be generally competent *to decide every difficulty*—and that a commission of scientific men, habituated to those matters, should not be at least equally competent to decide on every thing, that may come before them, I am at a loss to discover; there appears a discrepancy in Mr. Abbott's evidence.

Mr. Rotch, a counsel of some experience in patent matters, gives the following opinion upon the usual incapacity of Attorney Generals upon scientific subjects,—Rep. p. 118. "I think in the case of the Attorney General, such gross injustice is done unwittingly:" this applies merely to the situation of things, not to individuals, but I have seen such gross injustice done at the Attorney General's Office, for want of that particular knowledge, it is not one Attorney General in twenty, has that mechanical knowledge; I will say, grovelling knowledge for him, which is required, it must be quite mechanical and chemical knowledge. I have seen great injustice, there is about twelve pounds charged at each opposition to the parties. Ten chances to one, a mechanic puts questions which the Attorney General does not see the bearing of, and you have a great chance to find out what it is before you leave him. That occurs from the want of that knowledge which is not necessary an Attorney General should have for any other purpose, *and which very few have*. There is no appeal from that tribunal, because, if I apply for a patent, and another opposes me, and he says he has used something like it some years ago, and he shews it to the Attorney General behind my back—(*for he receives each party privately*)—he then comes out of the room—I go in, and state what my patent is; the Attorney General says, "I cannot give you a patent for this, because it is in use already." I say, "Tell me what it is?"—"Oh, no!"—You are entirely at the mercy of the Attorney-General. If a man has dressed up anything that looks like it, on which the Attorney-General, *in want of mechanical knowledge*, thinks like it, he determines at once—you cannot have your patent; he will not report to the king, that it is a proper subject to have a patent granted for, and you have no appeal whatever from his decision; that of itself shews the necessity of having a competent person to judge of the similitude of the inventions." Rep. p. 119.

Davies Gilbert Esq. M.P. a member of the Committee, in his examination, says, "I think it would be highly expedient that some person or persons more competent to judge of scientific matters and invention than the Attorney-General, from the course of his ordinary pursuits is in general found to be, should be called to his assistance; but I would not preclude either party from any subsequent legal remedy he may choose to adopt." Rep. p. 15. With these sensible views, I entirely concur, but carry this *principle* further.

The general occupations, previous habits, education and official legal duties of an Attorney and Solicitor General, render them incompetent to decide at all in scientific matters. The cognizance of patents for inventions should be entirely withdrawn from them, and placed in a commission which could avail itself of their *legal* information, as officers of the crown, in such cases where the commission might require their assistance. The whole of the Attorney General's interference with inventions from the petition to the patent, is a mere clog to the progress of arts and commerce. The injuries inflicted by his delays, occupations and want of information, are referred to by almost every witness. Mr. M. Poole, his patent clerk, is asked, "Does the Attorney General ever call in a scientific person to assist him in his judgment?" "I never knew it done" p. 84. Sir Samuel Shepherd gave Mr. M. Poole the office when his father died, "who was in the office for thirty-six years before that period." Rep. p. 85. So Mr. M. Poole must have known the practice for many years.

Thus a man who can seldom have anything like adequate knowledge in scientific matters, and who does not habitually avail himself of the assistance of competent persons, gives judgment without appeal, in matters of property and of universal importance!! This is a feature of the *system* which the late Attorney General in parliament found it very inconvenient to withdraw from the *protection* of the seals and its officers!!

The first necessary forms under the present fee-gathering system are, the affidavit of invention, and the accompanying petition *to the King* for a patent. "That petition being presented to the King through the Secretary of State, a reference is made by the Secretary of State in the name of the King, to the Attorney or to the Solicitor General to report." Mr. F. Abbott, —Rep. p. 48, and seq. Now all this process is *pure humbug*. The King never sees the petition with his natural optics, nor does the Secretary of State even present it to *himself* pro forma in nomine regis, but his officer upon payment of his fee returns it endorsed, with a short reference to Mr. Attorney or Solicitor General, for his *accommodating report*, which, upon payment of 4*l*. 4*s*. fee, is to open like a pioneer, the road for the majestic procession of the royal warrants under the seals, and their metamorphosed ensigns—"the King's bill," "the signet bill," "the privy seal bill," and the great hanaper, the old state-coach in the rear.

"What is the object of that reference? It is to have the Attorney or Solicitor General's opinion, on the propriety of granting such a patent as the inventor requests."—Rept. p. 24. Why then, in the name of common sense, should not the petition be at once presented, *if at all necessary*, to the party who is to report upon its propriety—thereby saving four journeys of the agent to and from the Secretary of State's Offices, and the fee? But the petition itself is totally unnecessary, except for it's uses to the fee-takers; its place could be amply supplied by the affidavit, containing a short description of the invention, upon which all *fair* opposition could be raised.

The accommodating report, stating the Attorney General's opinion, that the invention sought to be patented will be for the public benefit, and therefore recommending it, is certainly a mere fee-catcher. Mr. W. Newton's sensible evidence, Rep. p. 69, gives the *quietus* to the Report, and its consequent fee.—"Mr. Attorney General reports that he has examined the subject, and finds it will be for the benefit of the country, that the King should grant the Patent; whereas, we all know that the Attorney General is otherwise occupied, and that he is not at all acquainted with any more than the petition." This evidence is of importance, because it proves the inutility of the report founded upon the petitioners own statement; and consequently of the preceding forms, and the fees connected with them and the report. Mr. Abbott truly sets it down as "*a mere formality.*"

In case of opposition in this stage of the business, which can seldom occur if no caveat affecting the invention be lodged, Mr. Attorney General must necessarily exercise some discretion, that consists, as Mr. A. states, in his "almost always seeing sufficient ground of new invention to grant the patent, or both, if two are applied for; therefore oppositions become of no effect." It is therefore evident, that as far as inventors are concerned, the whole paraphernalia of petition, reference, report and fees may be safely dispensed with—"That report is taken back to the Secretary of State's office, for what is called the King's warrant, to prepare the bill; that warrant recites shortly that such a person has applied for a patent, and *that the King is advised to grant it.*" This is a continuation of the farce of Mr. Attorney General's examination of the subject." The king is about as much "*advised*" in the matter, as he is of the contents of that tautoligical production the bill, which contains the future patent verbatim in its convolutions—safely swaddled like an Egyptian mummy in two thousand yards of bandage. Professor Millington, p. 101, terms the whole a "non-efficient process."

A warrant to the signet under the royal sign manual, countersigned by the Secretary of State for the Home Department, is forwarded for making out the patent. Now, upon the subject of the two warrants under the sign manual, some most important information has been incidentally elicited—*evidence of that nature which should induce parliament at once to suppress the whole system of Patents for Inventions under warrants, signets, and seals.*

Mr. Rotch, in his examination by the Committee, upon a question relative to the time which should be allowed for enrolling the specification, says—"No man should have more than two months; so that everybody should have the same time at any rate, thereby allowing a man to be secure the moment he enters his petition; then one man could not get the advantage of the other. I have known one man *upset another, because he had the ear (I will not name names) of a person about his Majesty who could get his paper signed; and I have known* ONE HUNDRED GUINEAS *given for signing one paper before another.*" Rep. 117. Here is an illustration of the doctrine of "*bargain and reward!!!*" Mr. Rotch's character is above the suspicion of deliberately and publicly stating an untruth. The abuse of the royal prerogative—the obtaining the signature of his Majesty by such means—the upsetting of men's rights by such scandalous agency—the reward of one hundred guineas for that or a similar transaction, no matter which—the treachery both to the king and to individuals by such iniquitous proceedings, are subjects claiming the most serious attention.

Who is the party having the ear of a person about His Majesty? Who is the person about the King who can get the royal signature to a warrant "to the upsetting of another man's rights," whose document must of course have been withheld from its proper right of previous signature? Who are the men, who can dare to tamper with their duty to their sovereign, and treasonably pervert his royal prerogative, allowed only for the public weal—to an instrument of fraud and injustice from the vile and sordid lust of gain? Who is, I would demand, the party, who, trafficking in royal warrants, received the one hundred guineas, for procuring the signature by his Majesty of one *official* paper before another?—*Who could these parties be, but men* OFFICIALLY *connected with the keeping, controul, and presentation to the King of these documents*?

The Committee passed, without a single demand of explanation, a point of evidence which has accidentally thrown more light upon the transactions connected with the passing of warrants under the royal sign manual, and the dark proceedings to which inventors are subjected by patents under the seals, than could have been conceived by the most determined opposer of this complicated system of oppression. Was there no member then present upon the Committee of judgment, integrity, and independence sufficient to sift this most important matter in its bearings, agencies, and consequences? Or are, indeed, the most flagitious and corrupt uses of a sacred trust, by its officers, so common that evidence of them shall not claim the least attention of a public Committee sitting for the professed amelioration this perverted system? Or is "Prerogative" *so hedged in with divinity*, that its most baneful and injurious abuses under the insidious forms of *protection* to the subject are to remain unclipped—to be submitted to quietly and patiently by those who are clandestinely oppressed, injured, and circumvented under those forms?

How often this scandalous and untraceable dealing with the royal sign manual to "the upsetting of men's rights" may have occurred—in how many instances "one hundred guineas have been given for signing one paper before another," no single evidence can show—no man can possibly know; how many have been injured by these sales of the prerogative to the deprivation of their means of subsistence, cannot be ascertained,—*who* or how many may *at this* moment be subject to these most infamous official violations of trust, none can calculate—but this I feel, that if such an abominable system of fraud and unfathomable deception, under pretence of *protection*, is attempted to be continued after this public exposure of the wrongs to which it subjects men, the sooner the most public determined and united opposition to these iniquitous abuses of the "prerogative" be entered upon, the better. I know of no moral obligation by which men are bound in fettered submission to oppression, in supine acquiescence to injury, or in unresisting obedience to the pretensions—the mummery—the mystifications, and the *treachery* of those who undertake to govern the community.

VINDICATOR.

The following is the Report of the Committee upon the Patent law, &c.—That, after such a Report, three months of a short session should be allowed to pass without their re-appointment, is a matter of equal astonishment, regret and dissatisfaction.

REPORT.

"Of the SELECT COMMITTEE appointed to inquire into the present state of the law and practice relative to the granting of PATENTS for INVENTIONS, *and to report their observations thereupon to the House, &c.* have agreed to the following REPORT:—

The subject referred to the consideration of your Committee is in its nature so intricate and important, that it has occasioned the necessity of examining witnesses at great length. At the present late period of the session they are *only* prepared to report the minutes of the evidence taken before them, together with the several documents; *and they earnestly re-*

commend to the House that the inquiry may be resumed early in the next session.

What has prevented the early resumption of this "important and intricate subject?" Has Mr. Rotch's inconvenient evidence upon the sign manual traffic, and the hundred guineas, threatend destruction to the *system*? Pray, Mr. Lennard, have the goodness to explain to the public—WHY *you*, as chairman, have not yet moved for the re-appointment of your Committee, according to its *earnest recommendation*?

Recent Patents.

To GEORGE VAUGHAN, *of Cleveland Street, Mile End Road, in the Parish of Mile End Old Town, in the County of Middlesex, Engineer, for his Invention of a Machine or Pump for raising water or other fluids.* [Sealed 23rd of January, 1830.]

THE subject of this Patent is described as a novel arrangement of the parts of a pump, for raising and forcing water, in which the piston or bucket is made to act in a horizontal direction. This construction of pump is intended to be applied to the raising of water for ordinary supplies, for pumping ships, exhausting rivers, &c. and also as an injecting pump for fire engines. The following is the

SPECIFICATION.

"My invention of a machine or pump for raising water or other fluids, consists in a peculiar disposition or arrangement of the valves and piston of a double action, exhausting and force pump; the particulars of which are exhibited in the drawing hereto annexed.

"Plate III. fig. 1, is a view of the apparatus complete, as it would appear on the upper side with the cranks and rods for working the piston, which is placed horizontally in the box *a, a.* Fig. 2, is a longitudinal section of the same, taken vertically, shewing the water wings, valves, and piston within the box. Fg. 3, is a transverse section of the box taken through the middle; in all which figures similar letters refer to corresponding parts of the apparatus; *a,* is the rising main, through which the water passes from the well or reservoir into the lower chamber *b, b,* of the box; *c,* and *d,* are valves opening upwards for the purpose of allowing the water to flow from the lower part of the box into the working barrel *e, e*; the piston *f,* moves horizontally to and fro in the barrel, for the purpose of producing an exhaustion behind it, by which the water is made to rise into the barrel; and also for the purpose of forcing the water before it out of the barrel through the upper valves *g,* and *h,* alternately, into the upper chamber *i,* from whence it flows away, or is raised through the pipe *k.*

"The mode by which I propose to work the piston of this pump, is by attaching to the outer end of the piston rod *j,* two crank rods *l, l,* connected together by a cross bar *m,* the reverse ends of which rods are attached to the cranks *n, n,* and the motion is given by winches affixed to the ends of the crank shaft *o,* worked by manual labour; or by a rigger or toothed gear affixed to the crank shaft, which may be driven by steam or other power.

"I do not, however, intend to confine myself to this particular mode of actuating the pumps, as various other modes may be devised, though not possessing equal facilities according to my opinion.

" The requisite power being applied; the piston *f*, is made to reciprocate, and when proceeding in that direction which is toward the right hand in the drawing, figs. 1, and 2, the vacuum being behind the piston, the valve *c*, will rise, and the water will flow from the main into the box and through the aperture of the valve *e*, into the barrel following the piston. When by the returning stroke the piston proceeds towards the left hand, the valve *c*, will close, and the valve *d*, open, the water then following, the piston will pass through the aperture of *d*, into the barrel; while that water which was taken into the barrel by the previous stroke is now forced out by the advance of the piston through the valve *g*; this operation being continued, causes the water at every stroke to rise up the main into the vacuum in the barrel formed behind the piston, and to be expelled through the upper valves by the force of the piston.

" In order to prevent the piston wearing unequally on the lower side, I continue the piston rod as at *p*, providing a hollow tube *q*, for it to pass into, and support the piston rod upon an antifriction pulley *r*; at the reverse end of the piston rod I attach antifriction rollers *s*, *s*, running in guides *t*, *t*, and secure the piston rod in the box by a suitable stuffing, as at *u*.

" I have described by the figures in the drawing a rectangular box with a curved top, but I do not mean to confine myself to that particalar shape, as a box of any other convenient shape would perhaps answer equally well. Neither do I intend to confine myself to a square piston, as a circular piston in a cylindrical barrel might answer the same purpose."

(Inrolled in the Rolls Chapel Office, March, 1830.*)*

Specification drawn by Mr. Newton.

To Thomas Banks, *of Patricroft-within-Barton-upon-Irwell, in the County Palatine, of Lancaster, Civil Engineer, for his Improvements in Steam Engines.*—[Sealed 30th Sep. 1829.]

These improvements are a novel mode of effecting the induction and eduction of steam, by a peculiar apparatus to be attached to the working cylinder; and in the mode of introducing the oil or other lubricating material into the cylinder to prevent friction in working the piston. The following description explains the construction of the apparatus:—

SPECIFICATION.

"My said invention consists, first, of an improved method of supplying the main cylinder of the steam engine with steam, and carrying off the same by means of a pipe acting within by an alternating circular movement, as hereinafter described; and secondly, in conveying liquid, tallow, or other lubricating matter to the rubbing surfaces of the piston and cylinder, down the interior of the piston rod.

"Plate IV. fig. 1, represents a vertical section of a moveable pipe to be attached to the main cylinder, and of the turned part of a main steam pipe, which I insert into the upper end of the said moveable pipe. The junction of these pipes is tightened and adjusted by means of a stuffing box, a section whereof is also shewn. The lower end of the said moveable pipe I insert into a stuffing box, joined to the condensing cylinder, or when no condensor is used, it may be supported in any eligible manner.

"In fig. 1, the dark shades on the edge of the pipe are intended to shew the shell or crust of the pipe; the two large collars *m*, *m*, *m*, *m*, shew where the tube is to be attached to the main cylinder by circular boxes, through which are passages to convey the steam from the pipe to the upper and lower surfaces of the piston; the shaded parts *a*, *b*, *a*, 1, *b*, 1, represent four quadrangular openings or orifices in the said moveable pipe, each pair of which orfices *a*, *b*, and *a*, 1, *b*, 1, are separated by a space at least equal to the breadth of the orifice.

"The orifices in the main cylinder should be of the same form and magnitude as those in the moveable pipe.

"A spiral plate or fixed partition is shewn at *e*, 1, *e*, 2, *e*, 3, (which may be conveniently cast with and as part of the pipe) divides this part of the said moveable pipe longitudinally into two equal spirally formed compartments or chambers; the steam flows into one chamber at *d*, which chamber terminates immediately below the orifice *a*, 1, and is continually full of steam; the letters *e*, 1, *e*, 2, shew the terminations or ends of the said spiral plates at the opposite end of the pipes.

"Hence it will be seen, that if the upper orifice *a*, in in the said moveable pipe, be opposite to the upper orifice in the main cylinder, the steam rushes in above the piston, which immediately descends; then by a small circular motion of the said moveable pipe from *b*, to *a*, the exhausting orifice *b*, is presented to the upper orifice of the cylinder, and the supplying orifice *a*, 1, below is presented to the lower orifice of the main cylinder. Now the piston rises until by a reverse motion of the pipe the upper orifice *a*, is again brought opposite to the orifice in the cylinder, and the lower exhausting orifice *b*, 1, is brought opposite to the lower orifice of the cylinder; thus by a small alternate motion of the pipe, the upper and lower parts of the cylinder are alternately filled and emptied.

"When the spaces between the orifices in the said moveable pipe are brought opposite to the orifices in the main cylinder, the engine is at rest; and thus by the alternate action of the pipe as before described, the steam engine is regularly supplied with steam and kept in action, or stopped and brought to rest at will.

"Fig. 2, represents a piston and piston rod; the vessel *a*, is connected with the tube in the piston rod marked by dotted lines, and is furnished with a cock at *b*; the tube through the centre of the piston rod, communicates at right angles with another tube passing through the piston, one end whereof is shewn at *c*.

"Fig. 3, shews the edge of a brass ring, a horizontal section of which is shewn at fig. 4; the edge of this ring is grooved, as shewn at *f*, and has two upright pieces cast to it, as shewn at *g*, *g*, and *g*, 1, *g*, 2.

"In the piston is a recess *d*, *e*, fitted to receive the upright pieces *g*, *h*, which have holes marked by dotted lines at *g*, 1, *f*, 1, in fig. 4, corresponding with the tube *c*, *c*, passing through the piston; the dotted lines about the piston at *k*, *k*, in fig. 2, shew the situation of the brass ring when fixed to the piston; at *i*, *i*, is shewn the bottom plate of the piston, and the dotted lines at *l*, *l*, shew the top plate; the space between the bottom plate *i*, *i*, and the brass ring *k*, *k*, is to be filled with suitable packing. The brass ring figs. 3, and 4, is next laid on, as shewn at *k*, then a second packing occupies the space between *k*, and *l*, and the upper plate *l*, *l*, is then screwed down to the piston.

"If the vessel *a*, be filled with liquid tallow, and the cock at *b*, open, the tallow will flow through the piston rod, the tube *c*, in the piston, and the holes *g*, 1, *f*, 1, in the brass ring to the inner surface of the cylinder between the two layers of packing. The number of tubes through the piston to the brass ring may be increased if considered desirable.

(Inrolled in the Roll's Chapel Office, March, 1830.*)*

Specification drawn by the Patentee.

To JOHN TUCKER, *of Hammersmith, in the county of Middlesex, Brewer, for certain Improvements in the construction of Cannon.*—[Sealed 9th Sept. 1829.]

THIS invention is a very simple contrivance to allow of a piece of ordnance being loaded at the breech, which is effected by boring the cannon competely through from end to end, and at the breech part introducing a conical plug into a hole passing perpendicularly through the cannon, which plug being considerably larger than the bore of the gun, acts as a breech when firing.

The plug has a hole perforated through, it coinciding with the bore of the gun, and is enabled to turn round in its socket by the employment of a key.

When the gun is about to be fired, the hole through the plug stands crossway, its solid part forming the breech; but when it is about to be loaded, the plug must be turned round so as to open the way from the breech through the gun, in order to introduce the ball and powder, after which the plug is turned round again, in order to secure the breeching.

SPECIFICATION.

"Plate III, fig. 6, is a longitudinal section of a cannon constructed on my improved plan; *a,* is the muzzle; *b,* is the breech; *i,* is the touch hole; *c, c,* is a conical plug bored to correspond with the bore of the cannon, supported yb the flange *f*, and made with a mortice, or square key hole *g*, into which the key *k*, fits, and by which key the plug is turned round, as will be explained hereafter.

"The cannon is here represented as loaded, but not prepared for firing; *h*, is the shot, and *j*, the cartridge; the ball is here shewn without any wadding or covering, but it should be wrapped in cloth, or else a wadding put first into the cannon, to detain the ball in its place. Fig. 7, is a separate view of the plug *c*, *c*, with its flange *f*. Fig. 8, is the ramrod; *s*, is the end for placing the shot, and *r*, the end for placing the cartridge. Fig. 9 is a separate view of the key; either *m*, or *n*, may be used to turn the plug, and *l*, is a catch which after being put into the mortice the longest way of the square, is turned a quarter round when *l*, catches under a lip or lug in the mortice by which the plug may be drawn out for the purpose of cleaning, cooling, examining, or repairing it, if necessary. Fig. 10, is a plan of the cannon, by which it will be seen that the flange *f*, acts against the two pins or stops *v*, *v*, under the flanged heads of which it passes, and is thereby kept from rising when the cannon is fired. The plug is here supposed to be turned in the position for firing with the bore of the plug at right angles with the bore of the cannon, and with the touch-hole exposed. When it is required to lift out the plug, it must be turned with the key till the notches *r*, *r*, come opposite their respective pins *v*, *v*, when the plug may be removed; the dotted plan of the flange in this figure, shows its position when the plug is in the position for loading, when it will be observed it again passes under the flanged heads of the pins *v*, *v*, and the touch-hole is covered; *x*, is the breech ring.

Having now described my different improvements, it only remains for me to show the manner of loading and firing the cannon hereinbefore described, and which is as follows: —having applied one or other of the ends *m*, or *n*, of the key *k*, to the mortice *g*, turn the plug till the flange *f*, comes to the position shewn at figure 1, and also by the dotted lines at figure 5, then put the ball in at the breech and with the end *s*, of the ramrod, push the ball from the breech as far as the ramrod will reach, which, it will be seen, is something short of the place where the ball is intended to be placed, so that the cartridge may push the remainder of the distance, and thus prevent any space being left between the ball and the cartridge; then proceed in the same way with the cartridge, using the end *r*, of the ramrod, and it is scarcely necessary to add, that this end of the ramrod must be so adjusted as to place the charge in the proper position as regards the plug and touch-hole; this being done, turn the plug till the flange *f*, comes to the position shewn at fig. 5, when a solid part of the plug will be opposed to the charge which (the touch hole being primed) may be fired off in the usual manner; it will be well to grease the plug, in order to facilitate its turning, and prevent dirt collecting round it from repeated discharges of the cannon.

Now Whereas I claim as my improvements the plug *e*, *e*, as applied to a cannon, and the parts connected with the application and use thereof; and such my said improvements being to the best of my knowledge and belief entirely new, &c.

(Inrolled in the Inrolment Office, March, 1830.)

Specification drawn by Mr. Rotch.

To James Dutton, Jun. *of Wotton-Under-Edge, in the County of Gloucester, clothier, for his having invented or found out certain Improvements in Propelling Ships, Boats, and other Vessels or floating bodies, by means of steam, or other power.*—[Sealed 19th May, 1829.]

The novelty proposed under this Patent is to employ buoyant plungers for propelling vessels on water, which plungers after being driven out by any mechanical force against the water in the act of propelling, are brought back to their place of rest simply by their buoyancy, thereby saving that expense of power which would otherwise be exerted in raising the propeller. The Patentee describes his invention as follows:—

SPECIFICATION.

"My invention of improvements in propelling ships, boats, or other vessels, or floating bodies by steam, or other power, consists of the three following features:—First, in the employment of a series of hollow vessels to be projected into the water at a considerable angle to the horizontal line or level surface of the water, which hollow vessels are intended to act as propellers, by striking against the water, and thereby propelling the vessel in an opposite direction. Secondly, in attaching each of these propellers to a piston rod, the pistons respectively working in small cylinders by the elastic power of steam or other means, which may cause them to be projected outward. Thirdly, in the buoyancy of the propellers, which being hollow vessels filled with air or other light material, will, after being projected, rise again by their levity or difference of specific gravity between the confined volume of air or other light material, and the volume of water displaced by it.

The mode which appears to me most eligible for putting these principles into operation, is exhibited in the drawing hereunto annexed, (see Plate III.) fig. 4. represents a longitudinal section of a vessel, to which five propellers on my improved plan are adapted. I propose that they shall be situated in a recess under the vessel, but do not confine myself to that precise number of propellers or situation, as it is probable that they might be adapted in a double series, one on each side of the vessel, with equally good effect; *a* 1, *a* 2, *a* 3, *a* 4, and *a* 5, are the propellers formed of hollow rectangular vessels of wood or other suitable material, closed with air and water-tight joints; but I do not intend to confine myself to the shape represented, though in the present state of my experience I prefer that form; *b*, *b*, *b*, are piston rods, passing through stuffing boxes in the usual way, the lower ends of which rods are affixed to the propelling plungers.

" These rods will be best seen at fiig. 5, which is drawn upon a larger scale, and represents the parts more in detail; *c*, *c*, *c*, are cylindrical tubes, one of which is shown in section *a*, fiig. 5, and *d*, is the piston affixed to the rod *b*, intended to work in the cylinder *c*,*c*, in a similar way to the piston of an ordinary steam engine; *e*,*e*, are transverse tubes connected to a steam pipe; *f*, *f*, *f*, which pipe and tubes conduct steam from a boiler to the several working cylinders *c*, *c*, *c*. Each transverse tube is furnished with its induction valve *g*, and eduction valve *h*, which are to be opened and closed at stated times for the ingress and egress of the steam to and from the working cylinder *c*.

" To the upper extremity of each piston rod a cross arm is attached, carrying two guide rods *i*, *i*, fiig, 4; and to these guide rods I propose to attach the tappets by which the valves *g*, and *h*, are to be opened and closed as the piston reciprocates; but I do not claim this contrivance as of my invention. nor intend to confine myself to that particular way of opening and closing the induction and eduction valves, as many other ways of effecting the same will readily suggest themselves to any competent engineer.

"Let it now be supposed that the induction valve *g*, fig. 5, has been opened, steam will immediately rush from the pipe *f*, into the transverse tube *e*, and the valve *h*, being closed, there will be no means of escape. The plunge being in a quiescent state, and the piston *d*, at top of the cylinder, the elastic force of the steam will act against the piston and cause it to slide down the cylinder, in which movement the plunger *a*, connected to the piston rod will be projected outward, as at *a* 3, fiig. 4, and by striking against the water will impel the vessel in the opposite direction. The tappets now coming in contact with the levers of the valves, the steam will be cut off and the eduction opened, allowing that steam which occupied the cylinder to blow off or to pass into a condenser.

"The buoyancy of the propelling plunger *a*, will now cause it to rise in the water, which being guided by antifriction rollers *k*,*k*,*k*, attached to its upper surface acting against inclined railways *l*,*l*, the plunger will return to its place of rest, without the exertion of any active power to raise it.

"It may be supposed that the plunger *a* 1, has been projected and returned to acst in the way described, at which time its tappets act on the valve for the purpose of projecting it again. The plunger *a* 6, has also been projected, and is in the act of returning by its buoyancy; the plunger *a* 3, has just been projected out by the force of the steam on the piston, and the plungers *a* 4, and *a* 5, have not yet been put into action.

"Thus it will be perceived that any number of these plungers placed at any desirable angle to the horizon (say 22½ degrees,) may be set to work, by letting the steam on, or any one of them shut off, if it should be found necessary by closing its steam valves, which leads from the pipe *f*, to any of the tranverse tubes, and by displacing the tappet, which should work them."

Specification drawn by Mr. Newton.

(Inrolled November, 1829.*)*

To William Percival, *of Knightsbridge, in the county of Middlesex, veterinary surgeon, for his new invented improvement in the construction and application of shoes without nails to the feet of horses and certain other animals.*—[Sealed 19th January, 1828.]

The object of this invention is to adapt shoes to such horses as have tender or injured hoofs, without the necessity of attaching them by means of nails, and for this purpose the patentee has contrived shoes with rings on the sides and hinder part, from which rings, straps or bandages are carried round the hoof of the horse and made fast by buckles.

The shoe itself is formed with a semicircular piece in front like the toe of other horse shoes, but which does not extend along to the hinder part of the foot. From the middle of the semicircular piece, a straight bar extends under the foot, but branches off into two angular bars, in order to leave the frog of the foot uncovered.

This particular form may be slightly varied according to circumstances, and to the size of the horse's foot; but the peculiar feature of novelty claimed by the Patentee, is to attach the shoe to the hoof by straps passed through rings.—(*Inrolled in the Inrolment Office, July* 1828.)

To John Davis, *of Leman Street, Goodman's Fields, in the county of Middlesex, Sugar Refiner, for an Improvement in boiling or evaporating solutions of sugar and other liquors.*—[Sealed 29th March, 1828.]

The object of the Patentee is to evaporate molasses and other solutions of sugar, by the assistance of a vacuum, which vacuum is proposed to be obtained without the employment of an air pump, simply by condensing steam in a vessel connected through pipes to the upper part of the sugar pan or boiler.

The construction of the apparatus as proposed, is shown in section in Plate IV. at fig. 5; *a*, is the boiler or sugar pan with its appendages, as constructed in the ordinary way for the boiling and evaporating of solutions of sugar; *b*, is a pipe leading from the boiler for the purpose of carrying away the steam; *c*, is a vessel immersed in a cold water tank *d*, which vessel *c*, is intended to receive a portion of the steam from the boiler through the pipe *b*, and after having condensed it, to pass the water down the pipe *e*, to the well *f*, below, at a depth of thirty-two feet.

A barrel, or other conveniently formed vessel, *g*, *g*, to be filled with water, is fixed above the other parts of the apparatus in a tank of water *h*, *h*, and within this barrel there are a series of paddles *i*, *i*, *i*, mounted upon a rotatory shaft, which is to be turned round by a winch or other contrivance, for the purpose of disturbing the water within the vessel.

The general features of the apparatus being explained, we proceed to describe its operation. Water, from an elevated situation, is admitted through the pipe *k*, by means of suitable cocks into the barrel *g*, and its tank *h*, until both are full: the air escaping from the barrel through a valve at top. The supply cock of *k*, is then closed, and steam is admitted into the vessel *c*, from the boiler; that steam is then condensed in *c*, by a jet of water from the vessel *g*, through the pipe *e*; and the water which has escaped from the vessel *g*, runs down the pipe *l*, to the well, leaving a portion of the vessel *g*, and also the vessel *c*, in a state of vacuum, and the water in the pipe *e*, standing to the height of thirty-two feet, that is up to about the bottom of the vessel *c*, owing to to the pressure of the air on the water in the well below.

The steam being allowed to proceed freely from the boiler through the pipe *b*, one portion of it passes upwards through the pipe *m*, into the barrel *g*, and there pressing upon the surface of the water, causes it to flow through the pipe *l*, to the vessel *c*, while the other portion of the steam passes by the short pipe *n*, into *c*, and becomes condensed. Thus a vacuum is kept up in the vessel *c*, by the condensation of the steam in the way described as long as there remains any water in the barrel *g*, which, when expended, renders it necessary to suspend the operation of the boiler.

It is thought that the process will be more effectual if the air is extracted from the water in the vessel *g*, and for this purpose it is recommended that after lowering the water in the vessel *g*, before the steam is admitted, that the rotatory paddles be put in action so as to agitate the water and cause it to give out the air, when by again filling the vessel as described, the process may be carried on in the way above explained.

There is a glass tube *o*, at the side of the tank *h*, with tubes communicating with the interior of the barrel by which glass tube the height of the water in the barrel *g*, may always be ascertained.

In the interior of the vessel *c*, there is a bridge perforated with holes, and also wicker partitions, which are designed to spread the jet of water more effectually among the steam in the vessel and to assist the condensation. The apparatus is furnished with suitable stop cocks, and discharge cocks, and a valve at the bottom of the pipe *e*, in the well, with a string leading from the valve up to the side of the tank *d*, by which the valve may be opened in setting the apparatus to work.

The patentee states his claim of invention to consist in causing the steam from the sugar boiling pans to pass up two channels, the one to press upon the water and produce the necessary discharge into the vessel *c*, the other to furnish the steam for condensation in the vessel, and the torricellian vacuum produced in the column or pipe of thirty-two feet, descending into the well. The precise forms of the several parts of the apparatus are of no particular consequence, and their dimensions must be according to the quantity of sugar to be evaporated in the boiler or pan.

Inrolled in the Inrolment Office, Sept. 1828.

To DANIEL JOBBINS, *of Uley, in the county of Gloucester, Millman, for his having invented an improved method by certain machinery applicable to stocks or pulling machine, of milling and scowering woollen cloths and other fabrics requiring such process.*—[Sealed June 3, 1828.]

THE beaters of pulling machines or stocks have usually been actuated by a revolving tappet-wheel, which raised the ends of the beaters successively, and then let them fall with a powerful blow upon the cloth under operation. Latterly, however, it has been suggested, that, instead of the tappet-wheel, the beaters might be advantageously raised and lowered by attaching their ends to a rotatory crank, as in the specification of Bermon's patent. (See our First Series, vol. xii. p. 170, and Plate IX.) But this plan appears to be attended with inconvenience, from the beater not falling with sufficient impetus, and also from the beater being always driven to the same point, whatever might be the thickness of the cloth in the stock which consequently subjected the cloth to injury.

The patentee therefore adhering to the principle of working the beaters by rotatory cranks, has proposed to attach the cranks to the beaters by jointed rods, as shewn in Plate IV. fig. 7; *a*, is the cloth under operation in the stock; *b c*, are the beaters *d*; a wheel, with two cranks extending from its axle. To these cranks, and also to the outer ends of the beaters, the jointed connecting rods, *e*, and *f*, are attached.

It will be seen in the figure that the crank has raised the beater *b*, by means of the jointed rod *e*, but when the crank has passed further round, the jointed rod will collapse as at *f*, and allow the beater to fall into the situation of *c*.

Thus, by the successive operations of the cranks and jointed connecting rods, the beaters will be put in action, and allowed to fall with an impetus, and the stock be worked with greater rapidity than upon the old principle of the rotatory tappets.

It is further suggested, that spiral springs might be attached to the connecting rods, but in what way is not shewn.—[*Inrolled in the Inrolment Office, August,* 1828.]

To JOHN DAVIS *of Lemon-street, in the County of Middlesex, sugar refiner, in consequence of a communication made to him by a certain foreigner residing abroad, for a certain improvement in the condensor used with the said* JOHN DAVIS'S *apparatus for boiling sugar, in vacuo ; for which a Patent was granted to him the* 29*th March,* 1828, *intitled an improvement in boiling or evaporating solutions of sugar and other liquids.*—[Sealed 28th April, 1829.]

THIS patent professes to be an improvement upon the foregoing. The construction of the apparatus is exactly the same in principle, as that above described, but the torricellian column is found to be unnecessary, and is therefore dispensed with, the condensed water being discharged into a reservoir or drain by a short horizontal pipe issuing from the bottom of the condensor, and the condensor itself is in this case much larger.

These appear to be the only features of difference, and we presume are intended to constitute the improvement, as the patentee says that he is now enabled to work his apparatus without the torricellian column, which in many situations would be extremely inconvenient to construct. —*Inrolled in the Inrolment Office, October,* 1829.

To EDWARD WEEKS, *of King's Road, Chelsea, in the county of Middlesex, Horticultural Builder, for his having invented certain Improvements in raising, lowering, or conveying heated water, or other fluids, to various distances.*—[Sealed, 14th August, 1829.]

THE object of this invention is to convey hot water in tubes extending round a hot-house, in order to heat the air, for the purpose of promoting vegetation. The Patentee acknowledges that hot water has been employed for this purpose, both by himself and others, before the date of this patent, but he founds his claim of invention in the present instance to the four following particulars.

First, in applying a cistern to the boiler for the purpose of supplying it with water, without making that cistern a part of the boiler, but only connected thereto by a tube; secondly, in a method of raising heated water to any required height, for the purpose of warming the upper parts of the building, without employing pumps or syphons; thirdly, in the employment of a large ascending pipe with a smaller returning pipe within it, which shall convey the water after it has parted with a portion of its heat, at an elevated situation, back again to the cistern, and thence into the boiler; and fourthly, in the adaptation of smaller pipes for conducting the heated water to any particular part of the building while the main pipes or tubes may be closed, and out of action. These several improvements are set out in the drawing exhibited in Plate IV.

Fig. 6, represents the apparatus partly in section; *a*, is the furnace; *b*, *b*, the boiler; *c*, the cistern for supplying the boiler from which the water passes through the tube *d*; the heated water rises from the boiler through an inclined tube *e*, into a chamber *f*, and from thence passes along the flat tube *g*, *g*.

This tube *g*, is proposed to be two or three feet broad, and only a few inches deep, in order that its upper surface may send up as much heat as possible; at the end of the tube *g*, there is a receptacle into which the water is discharged, and from thence it passes by the lower tube *h*, back to the cistern *c*, and descends again through the tube *a,* to the boiler, thus producing a continued current of hot water through the heating tube *g.*

In order to raise the heated water to a higher level a close box *i,* is affixed to a square chamber *k,* above the boiler, from which box the water ascends by the pipe *l,* into a receiver *m,* at the top, and from thence flows by the pipe or tube *n,* round the building, to be heated in the same way as through the tube *g,* already described, and having performed its circuit, descends by the pipe *o, o,* into the cistern. Such is the plan proposed by the patentee, but the principle upon which the water is said to rise in the pipe *l,* does not appear.

The third feature of the invention is shewn at *p,* where a large pipe is intended to carry up the heated water from a close vessel similar to *i,* inserted into the tube *g,* and within this large pipe is a smaller one for bringing down the water again.

The fourth suggestion is to adapt small pipes passing along side of the tube *g,* and branching off, if necessary, to the sides, in order to convey the heated water into other parts of the building. These may be employed when there is but little fire in the furnace, and consequently, but a small quantity of heated water will be put in circulation; to employ these small tubes in the way proposed, it will be necessary to close the entrance tube *g,* and also the exit of the tube *h,* in order to prevent the circulation going on in those tubes.—(*Inrolled in the Inrolment Office, February,* 1830.)

AMERICAN PATENTS,

From the Franklin Institute.

For a Thrashing Machine. Granted to James S. Wood, *Pattonsburg, Botetourt county, Virginia.*

The thrashing part of the machine is composed of a cylinder, and a curve, in which the cylinder revolves. The cylinder is five feet long and twenty-one inches in diameter. Strips of hoop iron are nailed lengthwise upon the cylinder, so as to cover its whole surface, the edge of one lapping upon another, and thus forming a series of ridges or furrows all around it. Four rows of projecting iron points are affixed in the cylinder, to serve as feeders, to force the straw between the cylinder and the curve; these stand out about three quarters of an inch above the surface of the cylinder. The curve is a piece of timber, hollowed out to suit the roller; it is placed in front of it, its hollowed part extending in width about nine inches, from a little below the centre, to the upper part of the roller, and above it rises a piece of plank to conduct the straw into the hollowed part. The curve is covered with strips of iron, in the same manner as the roller, there being vertical gooves in it to allow the projecting feeders of the cylinder to pass it in their revolution.

The distance between the curve and the cylinder is about three sixteenth's of an inch. The cylinder is made to revolve about 220 times in a minute, by any proper means. The wheat, or other grain, to be thrashed, is laid lengthwise of the roller, between it and the guide piece, and is carried down by the feeders. Two persons are employed in feeding, the cylinder being long enough to take in two lengths of the straw. There is no feeding apron, the sheaves being unbound, and laid upon an inclined platform just above, and back of the cylinder, whence it is taken by hand.

The gudgeons of the roller work in sliding timbers, which admits of the space between it and the curve being changed, according to the nature of the grain to be thrashed. The mode of doing this may be varied, and is not claimed, the thrashing part being all that is considered as new. The specification concludes thus:—

" The following is intended as a view of the features of this machine, designating it from all other inventions of the same kind."

" This machine differs from all others that thrash by means of a cylinder and curve, viz. in the first place, in the mode in which it forces the straw through the space between the cylinder and curve, by means of the feeders; thereby rendering it impossible for the straw to clog up in the space, and choke the machine, which is a disadvantage attendant on other machines working with a cylinder and curve."

" Secondly, it differs in this, that the straw is, by means of the feeders, confined to that part of the surface of the cylinder on which it first falls, and is forced through the space between the cylinder and curve, with the same velocity that the surface of the cylinder moves; whereas, in other machines, working with a cylinder and curve, the straw is not forced through the said space with any thing like the same velocity that the surface of the cylinder runs, but remains awhile in the curve while the cylinder glides, or runs upon it. The advantage arising from the straw being confined to the surface of the cylinder is considered to be this, that the impulse or shock given to heads of the grain on their being dragged through the said space by the feeders (with equal velocity with the cylinder) is much greater than when the cylinder glides or runs upon the straw, and requires little more than half the velocity in the cylinder that is required on the other plan, and a consequent proportional diminution of the power necessary to apply to the machine when thrashing; as is proven in the fact, that one horse of ordinary strength is able in this machine to thrash out 100 bushels of wheat in a day, provided the wheat is sufficiently good to yield a bushel to two dozen, and with this power from seven to eight sheaves can be thrashed in a minute.

A third property of this machine, distinguishing it from others, relates to the mode in which it gets out the grain, viz. the straw being confined by the feeders to the surface of the cylinder, as before stated, the instant it falls on its surface, the head of the grain is severely lashed against the said piece of timber placed on the top of the curve; and whatever may remain in the head is rubbed off, by the furrows in the curve, in its passage through the space between the cylinder and the curve. The curve, therefore, of this machine is more effective in thrashing or rubbing out the grain than the cylinder; whereas, in the other machines alluded to, the cylinder is most effective, as its surface runs on the heads of the grain, and its furrows rub it out while the heads of the grain remain for awhile in the curve.

For an improvement in working Pumps, called the "Geared Pump;" Manuel Francis, *Boston, Mass.*

The Patentee begins by telling us, "my invention consists in the application of a windlass, and a train of multiplying wheels and pinions, so constructed as to work a pump by the power of a weight applied to the windlass, or barrel."

Need we tell any thing more about the invention? certainly not to one who has passed the *pons assinorum* in mechanics.

There are three wheels working in three pinions, each increasing the motion about threefold. The last pinion carries the pitman, or shackle-bar, which is to work the pump. A ratchet wheel and click is attached to the barrel upon which the rope sustaining the weight is to be wound. "A balance wheel proportioned to the moving power, is attached to the arbor of the crank."

The hope to obtain an increase of the effective power of a machine, whilst the motive power remains unchanged, results from a total ignorance of what is meant by the quantity of motion, and this ignorance is the parent of most of the absurd propositions which are made in mechanics. In the examples before us, besides this error, there would be a loss of about one-third of the power applied from the friction of wheels and gudgeons, and the rigidity of cords.

3

For a Double Acting Pump, with one cylinder and piston, Russel Wileman, *East Hartford, Hartford County, Connecticut.*

Double acting pumps with single pistons are by no means new; they were not so when used at the old water works in Philadelphia nearly thirty years ago; they are now employed in an improved form at the new works, and have been variously modified, according to the purpose for which they were required, or the fancy of the maker.

To those who understand the construction of Boulton and Watt's double acting engine, it is only necessary to say, that the pump for which Mr. Wileman has taken a patent, resembles it very closely. Imagine the induction, to be the supply pipe, and the eduction, the delivering, or dircharging pipe, and you have the whole apparatus.

In the plate which forms the bottom of the cylinder, there are cavities to connect it with the supply and discharge pipes; these are claimed by the patentee, and are, in fact, the only things absolutely claimed, the remainder being *conditional*, and in the subjoined words, "the other parts described in this specification I claim only so far as they shall be found original with myself."

The Patentee thus leaves it to others to discover what is new in the construction of his machine, a task which, we apprehend, the law will not impose upon them, and, if it did, it is one which we fear they might find it difficult to perform.

For a Machine for dressing Hemp and Flax, Horace L. Barnum and Matthew Stevenson, M. D. *The former of Washington City, D. C., the latter of Cambridge, Washington county, New York.*

This, like most of the breaking machines for hemp and flax, is to operate by fluted rollers, mashing into each other. A large iron cog wheel is made to revolve by any suitable means. The teeth of this wheel drive pinions upon the ends of rollers which are placed around it, so as to embrace about three-fourths of its circumference. In the drawing which accompanies the specification, twelve rollers are represented, one side being left free to supply and deliver the hemp.

The rollers above described stand at a small distance from each other, and are surrounded with another set of fluted rollers. The gudgeons of these exterior rollers are placed so as to stand exactly opposite to the spaces between the interior rollers, so that the flutes of one exterior may mash into those of two interior rollers. This, where there are twelve of the latter, will, of course, require eleven of the former.

There is a feeding apron to supply the hemp to be broken, which is placed opposite to the upper pair of rollers, and a receiving cloth, upon which it is delivered from the lower pair. In passing between the two rows of rollers, the hemp or flax receives an undulating motion, being acted upon twice by each of the rollers, in consequence of each mashing into two others. This, it is said, gives a decided advantage to the machine.

The gudgeons of the exterior rollers work in slots, so that they may be borne up against the interior, by means of springs, weights, or pulleys, or by a weighted lever, the latter being preferred, as it is readily graduated to any desired pressure.

The patentees claim "the application of the moving power, applied to fluted, or other rollers, for the purpose exemplified, or for any other purpose to which it may be applicable."

"The disposition of the fluted, or other rollers, without limiting their dimensions, or without confining themselves to any number of rollers, or any particular mode of gearing them."

"The mode of applying the lever, or pulley, to give the pressure."

For an Improvement in the Hoe; GIDEON FREEBORN, *New York.*

THE following thirty words comprise the whole of the specification.

"The improvement consists solely in the use of malleable cast iron, as a material for the formation of the eye, to be fastened with rivets, or to be welded on."

We admire brevity, but it should be coupled with clearness, and this certainly is not the case with the foregoing description. What is the "malleable cast-iron" intended? Is it cast iron rendered malleable by annealing? Will iron of this description weld? We apprehend that the annealed cast iron is the kind meant, but are not aware that this can be welded.

For a Horizontal Rack and Pinion Cotton Press; ZENOS BRONSON, *Jaspar County, Georgia.*

HORIZONTAL presses for packing cotton, are well known in the south. The improvement proposed by the present patentee, is, the forcing the follower of the press onward, by means of a rack and pinion. In the drawing there are two large cog wheels, and three pinions used, by which any desired power may be obtained.

The claim is to "the application of the rack and pinion, in the way described, for the purpose of packing cotton into boxes, or bales."

For an improved mode of making and applying Splints to Fractured Limbs; DAVID S. C. H. SMITH, *Physician, Sutton, Worcester county, Massachusetts.*

THESE splints are to be made of hatter's felt, which is to be saturated with shellac varnish. Moulds formed of plaster of Paris, or of carved wood, may be employed to give the varnished felt the proper shape. The felt is to be cut of such a size as to form a splint which will embrace rather more than one half the limb. When the varnish is dry, these splints are sufficiently stiff to retain the form given to them. To adapt them to a fractured limb, they are to be held over the steam of boiling water, which will render them sufficiently pliable to admit of their being moulded by the hand, and acquiring their final form from the limb itself. Counter splints are placed on the opposite side of the limb; these counter splints have buckles attached to them, which receive straps from the splints, to secure them in their places.

The patentee says, that "among the prominent advantages to be derived from the use of my felt splints, as above described, are, that the splints, when properly applied to the fractured limb, prevents its shortehing, and all motion between the divided ends of the bones, And as the splints can be exactly fitted to limbs of every kind and description, a bandage may be firmly applied without causing pain, excoriations, swelling, or other bad consequences arising from the unequal pressure of the splints."

"In fractures of the lower extremities, as of the leg below the knee, as, for instance, when both bones are broken, the patient can rise from his bed without the assistance of any one, and move upon crutches during the whole process of cure, not being under the necessity of being confined to the bed after the first shock of the injury has passed, and the consequent inflammation subsided, which usually takes place in five or six days; and in common cases, no confinement is required."

"What I claim, is, the *felt*, and the application of it to fractured limbs."

This claim is rather awkwardly expressed, as we apprehend that the Doctor does not mean to claim the *felt*, but his mode of forming it into a splint.

The moulding of splints to the limb is not new, and of this the patentee appears to be aware. Fractured limbs have been enclosed, in whole, or in part, in plaster of Paris, and other devices have been adopted for attaining the same end; but, perhaps, the present may be a real improvement upon all previous modes; we hope it may prove to be so, but in this case we shall regret that the Doctor had not followed the example of the numerous individuals among the members of a liberal profession, who have improved the art of surgery, and devoted their improvements freely to the aid of their brethren, and the relief of suffering humanity. Not that we think it improper, or incorrect, in a surgeon, to secure to himself, in certain cases, a fair remuneration for his discoveries. Trusses, or other instruments applicable to the cure of chronic diseases, appear to us fair subjects for patents; but the physician and the surgeon would be unpleasantly situated, were he compelled to purchase a right to the use, or forego the employment, of every discovery and improvement made within the last fourteen years.

For a method of Cleaning or Hulling rice, coffee, clover seed, and other grains or berries requiring to be hulled; Zenos Bronson, Jesper county, Georgia.

A number of hollow cylinders are made to revolve horizontally upon gudgeons, and parallel to each other. They may be made of wood or metal; and each of them is to be furnished with a door near to one end, to admit the grain, or other article to be hulled. Iron balls, rounded pebbles, or other hard substances, are put into these cylinders, the friction of which against the grain, is to produce the intended effect.

The cylinders are to be placed in a frame near the ceiling of a room; there are to be holes in the floor above, and supply spouts, corresponding with the openings in the cylinders. The frame is hinged so that the ends of the cylinders having the doors in them, may all be lowered, to deliver the grain, &c., the balls, or stones, being prevented from falling out by means of a grating.

A band is passed alternately above and below the cylinders, to cause them to revolve.

"What I claim as new, is, the mode of cleaning or hulling by means of revolving cylinders, in which the operation is performed by hard substances placed within them, as above described."

For an improved machine for Mortising, Boring, and Sawing ; Reuben Medley, Bloomfield, Nelson county, Kentucky.

The inventor of this machine has not pointed out any particular part which he claims ; we are, therefore, left to the conclusion, that the whole is new. The sawing part, is, we apprehend, intended principally for cutting tenons ; at all events, it is designed for articles of a moderate length only. A saw frame is moved vertically by a crank, and the article to be cut is fastened upon a carriage forced forward by a feed hand ; the piece to be mortised is to be secured, and made to advance in the same way, a second crank working the frame up and down, in which the chisel is fixed. The augers or bits for boring, are to fixed in the end of a vertical cylindrical shaft, working both above and below, through holes in guide pieces; a screw is cut upon the shaft, and in one of the guide pieces, or collars, and, in consequence, when the shaft is turned, the auger is raised, or lowered, by the action of the screw. By means of two fixed, and two moveable, whorls, and of two bands, one of which is crossed, the shaft may be made to turn in either direction, so as as to force forward, or to withdraw the auger. The whole machinery is to be moved by drums, whorls, and bands, acted upon by hand, or other power.

The only point of novelty which we perceive in this instrument, is, in the mode of forcing the auger forward, and withdrawing it; we are very apprehensive, however, that if this part be really new, it will not be found to be very useful. Bits, or augers, rarely admit of being forced forward by screws, and where they do, they must be screws of a very fine thread, but little calculated for the rapid whirling motion intended to be given by the kind of machinery which we have described.

The absence of any claim, leaves the patent upon, what appears to us, a very insecure basis.

REPORT

Of the Select Committee of the House of Commons on the Laws of Patents.

(Continued from Vol. IV. page 367.)

Mr. Samuel Morton, called in; and Examined.

Have you taken out any patents?—My brother Thomas Morton has, and I am connected with him in the patent; but they are in his name.

What are you?—I am a manufacturer of agricultural implements; my brother is a ship-builder, who invented an apparatus for hauling ships out of the water.

Can you speak as to the expense which is incurred in obtaining patents?—Yes; taking the three patents together for England, Ireland and Scotland, they cost about 450*l.* including agency.

Do you think that too great a price?—No, I cannot complain of the price, provided there were protection afforded.

Do you think that a patent when it is obtained, does not afford that protection which is desirable?—We have felt that.

Can you point out how it is that it fails to afford the protection which it professes to give?—It appeared that the publicity at least in our case was injurious, because the specification was laid before a scientific man in Glasgow, along with the plan of the apparatus to see how the patent could be evaded.

Are you then in favour of having the specification concealed?—I should rather say so.

Have you found any difficulty in drawing the specifications for your patents?—We were obliged to apply to a gentleman in town, who is in the habit of drawing specifications, that it might be done correctly.

Was your patent infringed?—It was.

Did you maintain it afterwards in a court of law?—We did maintain it, but at very considerable expense; because as soon as the trial was ended, the parties failed, and we have had the whole expense to pay ourselves, which was about 430*l.*

Have you been engaged in more than one trial?—Only one.

Have you any cause to complain of the difficulty of drawing a specification?—Not of drawing, but we can the risk of losing the benefit of the patent altogether, if the jury had taken a different view from what they did.

You heard the suggestion made by the last witness, with respect to lodging a model of the invention in some office; would that in your opinion be desirable?—I should think it would be very desirable, if there were a board established, to have the invention submitted to that board.

Supposing the invention were decided to be entitled to a patent, do you think it would be desirable, in order to secure the property of that patent, that the inventor should have a power of lodging a model of his invention?—I think it would be desirable.

Do you think that many inventors would avail themselves of that law?—I think they would; and I believe the law requires it now.

If the model was to be deposited, would you not expect it to be an extremely well finished working model, upon due proportions, so that a person might ascertain minutely every thing that was necessary to make such another?—It would be necessary that it should be made upon an exact scale certainly.

Have you found any inconvenience in the rule of law which limits the granting of a patent to five persons?—At one time we did feel a little of it, because at one time it was suggested to throw the thing open to a joint stock company, but the law prevented our attempting such a thing.

Do you conceive that that limitation of the law prevents any inventions from being carried into effect?—I dare say it may when they are very expensive, but I do not know any instance of it.

Do you conceive that it would be a beneficial alteration of the law to allow patents to be granted for a shorter time at a small expense?—I should think that there ought to be different periods; there are some patents that come into operation immediately, and five years might be sufficient for them; those that take rather longer in coming into operation might perhaps last for ten years. In our case the article was a very expensive one, and half of the period was expired before we derived any benefit from it.

Have you formed any opinion as to the possible advantage of appointing a commission of scientific persons to assist in deciding disputes as to patents?—I should think it decidedly superior to a court of law.

From your knowledge of the manufacturing community, do you think there would be a disposition to acquiesce in the authority of such a tribunal?—I should rather think so, at least I am perfectly convinced myself that it would be advantageous.

You think there would not be jealousies sufficient to interfere with its beneficial operation?—I should hardly think that; but it is a mere matter of opinion.

At all events, do you imagine that it would be considered a better tribunal than that of a Judge and an ordinary jury?—I should think it very superior, because it very frequently happens that the jury who may have to decide upon the patent are incapable of following it; but a board of scientific gentlemen would be capable of following every part of it.

Do you think that a tribunal of that sort might be so appointed as to produce confidence in its impartiality?—I should think so, much greater confidence than there could be in any jury.

Do you think it would be beneficial that that commission should be composed of a set of persons always acting upon it, or that there should be some power of appointing special commissions according to the particular case?—I should be inclined to think that a fixed board would be best.

Do you think it would be possible to find a board possessed of such universal knowledge of art and science, as to be qualified to judge upon all questions that might be brought before them?—If the board was pretty extensive, I think it might be done; and they might have the power of calling in other persons to assist them in particular cases.

Have you any other suggestions to make?—With respect to the terms upon which patents are given, I conceive that fourteen years is quite insufficient in many cases, especially in such a case as ours, which is a patent for hauling ships out of the water, where the invention is very expensive. A slip for hauling out a vessel of 500 tons, may cost from 1,500*l.* to 2,000*l.*; and although the utility of the thing was perfectly apparent to the public, they hesitated before they adopted it; the consequence of which was, that we were obliged to lay the slips down at first at a loss, purely to introduce them; the consequence of which will be, that it will be impossible for us to be remunerated, unless an extension of the term be allowed.

Have you applied to Parliament for an extension of the term?—No, we have not.

Have you an intention of doing so?—We have an intention to do so, unless this Committee shall make such an alteratien of the law so as to make it unnecessary.

Do you feel any objection to going to Parliament for an extension?—It is attended with considerable expense; and it is doubtful, as the law stands now, whether it may be granted; although this invention may be taken up in a national point of view.

What would be the expense of obtaining an extension by means of Parliament?—I understand, four or five hundred pounds.

Would much of that expense be incurred in the uncertainty whether you obtained the extension or not?—I believe so, but I cannot speak to that point.

To whom would you propose to give the power of extending the patent; if there was a board of commissioners, would you think them competent to determine it?—I should think that board the best possible tribunal, because they would know the merits of the invention; and they would know whether it deserved to be prolonged or not. The Board of Admiralty and the Navy Board approve highly of the invention, and they are likely to adopt it; and there is not an individual that has got one of them that does not admit that it has surpassed his expectations.

Have you experienced any inconvenience in the applications you have made for patents, from the delay which now occurs in the sealing of a patent?—We were very likely to suffer by that, because there was an attempted infringement of our patent before it was completed; the patent was delayed so long that the apparatus by which it was intended to infringe our patent was nearly finished; and it might have been finished in fourteen days more; from what cause the delay took place I do not know; I believe His Majesty was unwell, which prevented the patent being signed.

Then in that case, owing to a casualty over which you had no control, you were very nearly losing the benefit of the invention?—Yes.

In your applications for patents have you ever met with any opposition?—None.

Can you speak as to the degree of protection that is afforded by a caveat?—I suppose it is hardly any protection; I believe it often does harm.

Did you ever enter caveats?—We always did.

Have you ever received any notice in consequence?—Never.

Mr. John Farey called in; and examined.

You are a practical engineer?—That is my profession, and has been for many years.

Have you had considerable experience in the practice of taking out letters patent?—Yes, in assisting inventors professionally, to enable them to bring forward new inventions, and make them practically useful: in advising them how to secure their inventions by patent; in preparing titles and specifications for patents for new inventions; and assisting inventors to support their patent rights at law when disputed. In general, I might say, all those details of professional business that can be rendered advantageous to the interests of inventors; and independently of the technical formalities of obtaining a patent, all those accessory arrangements that can give value and security to the patent when obtained.

Can you explain what is the mode of proceeding in order to obtain a patent?—The only acts the inventor is obliged to perform himself, are the making an affidavit of his having invented the object for which he applies for a patent; paying his money; and afterwards making out, acknowleding, and signing the specification of that invention; all the rest may be done by his attorney, or patent agent, and his professional adviser or engineer.

Are you aware of the different steps that are necessary, from the first application at the Secretary of State's Office, to the sealing of the patent?—I am aware of them, but it is not my business to practise them, and therefore I should not speak to them with the same precision as other persons who transact that business.

By what channel are patents usually solicited?—Many are solicited by attornies; it is usual for most persons who have made an invention to apply to an attorney to obtain a patent; there are also patent agents who make it their business. Those patents which are solicited by attornies are divided amongst all that profession; but as the patent agents are continually employed in soliciting patents, and make it their express business, each of them passes a greater number than any individual attorney passes. It is not necessary to employ either an attorney or a patent agent, a patentee might do it himself; I did pursue one myself through all the offices nearly twenty years ago, by way of experiment, to try whether it would be worth my while to do that business in addition to the business I had then began, and have since conducted; but I found so much trouble and delay at the offices that I did not find it worth my attention.

Do your consider it more beneficial for a party applying for a patent, to make an application to an agent, than carry it through himself?—Decidedly so, the trouble would be excessive of carrying it through himself, and the preference of an agent to an attorney is, that the agent, by doing a greater number at once, has greater facility; the process is very complicated, and it is necessary to take the papers from one office to another, because when they are lodged at one office they are not forwarded from that office to the next, but they must be taken by the applicant or his agent, and often they are not ready for the delivery the first time he applies for them; I recollect that when I solicited a patent, by way of experiment, it occupied a large portion of the whole of my time, and interrupted all my proper professional studies.

Can you give the Committee any information of the expense necessary in taking out a patent?—I can state the sum totals: for England, I think it will be found to amount to 120*l.*; for Scotland, perhaps 100*l.*; and for Ireland, I think more than 125*l.*; and there is a small increase if the patent for England includes the colonies. Those are the amounts I always state to those who apply to me for advice respecting the expediency of taking out patents, but those sums include an average of ingrossing and stamps for the specifications.

Does the charge vary with the length of the specification?—With the length and with the difficulty: but the charges that depend most upon its difficulty are not included in the above sums, because professional charges for advice and assistance, in bringing the invention to bear, and specifying it, vary in every degree; I have had them as high as 200*l.* for one very intricate invention, where there were patents for all three kingdoms; and from that to as low as three guineas, where only an examination was required of what had been well prepared by the patentee himself: my brother drew up an average of all the charges we have made in the course of twenty years business, and I think it amounted to about 20*l.* for the specification and drawing to each invention; that was merely the professional charge for all the business relative to preparing the title of the patent, the draft of the spécification and the drawings, with duplicate drawings on parchment for the office. The patent agent ingrossing the writing on parchment, and finding stamps. Inventors who employ me, very commonly require more of my professional assistance than merely to prepare their titles and specifications, viz. to advise and assist them to put their plans in execution, make them working drawings, find them proper workmen, tools, old machines to alter for first trials, and to assist at their experiments, &c. but such charges are not included in the above average.

When it is desired to extend a patent to the colonies, is there any difficulty with respect to those colonies that have colonial legislatures?—I believe that it requires an express act of the colonial legislature, to enable disputes on the patent right to be tried in a colonial court of justice, otherwise they would be judged here, which would increase the expense of law proceedings beyond all bounds.

Are you aware of any instance in which a colonial legislature has refused to sanction a patent?—I am not; nor am I aware of many instances in which it has been applied for: the objection to having a patent for England and the Colonies, without an Act of the colonial legisture is, that all law proceedings being necessarily in this country, the expense of bringing over witnesses would be enormous, for an invention which is exclusively practised in the colonies. Those inventions are not very numerous, and hence it is not common to apply for such acts. In cases of inventions which are expected to be chiefly employed in this country and only occasionally in the colonies, the inventor might not think it worth while to apply for an act of the colonial legislature. The only instance which has come to my knowledge, is a recent patent to Mr. Hague, for expelling the molasses from sugar; he explained to me, that if law proceedings on such a patent right were limited to suing infringers, in our courts in this country, it would amount to a prohibition altogether; hence he applied for an act of the colonial legislature, at the same time with his patent for this country. It may be stated on that ground, that an invention which is entirely for the service of the colonies, will require an act of colonial legislature, in addition to the patent, to make it available; but they are very few; I suppose, with the exception of that invention, and half a dozen others that have never come into use, there will be no such cases found; there being but few manufactures that are exclusively practised in the colonies. I suppose they would require a separate act for each colony which has a legislative assembly.

What time does it take to obtain a patent?—It is said to be six weeks; but whether they have ever been obtained in six weeks or not, I cannot say; they are certainly now two months upon the average, and that is frequently extended to a much longer period.

During the time between making the application and sealing the patent, has the applicant any security for his invention?—No security whatever; there is even an increased necessity for secrecy beyond that which existed before his application, because his application has called attention to his procedure, and declared what is the object of his pursuit. A man who has proceeded with some freedom in his experiments, and in private trials of machinery, before he applies for his patent, is always obliged to shut up his models, and desist altogether, until he obtains a patent; for by his application, he calls the attention of all rivals to his proceedings, and any disclosure of his invention made before his patent is sealed, (however treacherously obtained,) would be fatal to his patent. It is a common practice of manufacturers, if they begin an invention solely for their own use, without any thought of a patent, when they have obtained such a prospect of advantageous results as to see that a patent would be desirable, they destroy all the models, and every vestige of them; and even send away the workmen who made them, on some distant embassy, to avoid any chance of the secret being called forth by the competition that exists among rival traders as soon as one makes an application for a patent. That is a very great inconvenience, and valuable time is lost to the public as well as to inventors.

Then there are no legal precautions that a man can take against that chance of losing his patent right?—None whatever; and it frequently happens that patents are delayed very long in their progress through the offices, so as to occasion a very great grievance. I had an instance of that recently; I prepared the title for an application for a patent on the 23d of June last, and I am certain that the first proceeding for a patent was taken by the attorney within a day or two of that date; but the patent was not obtained till the 31st of January, 1829; what made this peculiarly inconvenient was, that the inventor had made a trial of his invention before he thought of taking out a patent at all, and before he applied to me; I advised him to keep it a profound secret from the instant that he made an application for a patent, and I told him, that it would be from six weeks to two months, that he would be obliged to remain in secrecy and consequent inaction; but it proved to be more than seven months. In the mean time, another person conceived the same idea and opposed the grant of that patent before the Attorney-General, when the progress of the patent was far advanced; that opposition was not made till the 8th of December; and I believe that the invention, upon which the opposition was founded, did not exist at the time when the patent ought to have been granted, if there had been no delay.

Did this extraordinary delay arise out of any peculiar circumstances affecting that patent?—I am not aware of the circumstances, but there were no unusual circumstances attending the invention; it is probable that the King's health might have affected it, as in all cases I know that when the King is indisposed, the patents are delayed at the stage when His signature is required. In this case, the oppositon grew up in the meantime, and the applicant was obliged to answer it at considerable expense, and at the risk of his patent being refused, and further delay was occasioned.

The longer the delay between his application and the patent being granted the greater the risk of opposition?—Of course, the greater the risk of opposition and of discovery; the above inventor, Mr. Parker, is a lieutenant in the navy, and at that time had no occupation whatever, but he was waiting in total inaction till he could bring this invention forward. It is a self-acting drag, to be applied to travelling carriages, and he had so well digested his plan, that he was ready the very day after the patent was sealed, to begin to work with great vigour, and the thing was applied to a carriage, and tried in a short time after his patent was sealed; but if he had done so, in the time between applying for and obtaining it, he would have been subject to the loss of his patent, for the plan could not be concealed when it was taken out to try it on the public roads.

Are you aware of any other instances in which opposition to the patentee has arisen from new inventions which have grown up between the time of his making application for a patent and the time of his obtaining the patent?—That must be rare, because the instances of such long delay are not very common, and the chance of similar inventions growing up in the meantime is a combination of circumstances that is not likely to occur frequently. I smbmitted to the Attorney-General, when I appeared on the part of Lieutenant Parker, that we ought not to be called upon by opposition, from the circumstance that the invention by which we were opposed, had been made after the period when we ought to have had our patent granted; he took notice of the objection, saying, that we should have the benefit of it, if he should be of opinion that the inventions were the same.

Supposing, from any circumstance, a delay should inevitably arise between the application and the sealing of the patent, the Attorney-General has no means of securing the invention?—He has no means: I suppose that he might have refused to have entertained this opposition, but he did not decide whether he would or would not refuse the opposition, because he made an inquiry, and got rid of the opposition by another means, viz. that the inventions were not so similar as to prevent the patent. There were instances during the late King's indispositions, when no patents were granted for many weeks together, and oppositions to patents then in progress, must no doubt have arisen in the intervals of delay, but I have no knowledge of them, or how they were treated by the Attorney-General at the time.

Then the object of keeping an invention secret after it is determined to take a patent, arises out of these considerations; first, lest the invention should be pirated; and secondly, lest there should be such an act of publication as to vitiate the patent?—And also the risk of calling up an opposition to the grant of the patent; because the instant that any man, by any means, announces to his competitors in trade that he is engaged upon a new invention, they are all upon the watch to find out what it is, and if they know only the object of it, or what part of his processes it relates to, they can examine into the circumstances of their own processes to find out something for the like purpose, if not the same. Therefore it always happens, that when a patent is applied for, on any new subject, that there are several other applications for patents upon the same subject, following each other very quickly.

Do you not word the title obscurely, in order to avoid directing public attention to the subject?—Yes, but there is a danger in being too obscure, because then a court of justice may afterwards hold that it is an invalid patent, for want of coincidence between its title and the specification. It is one of the most metaphysical problems that I know, to prepare a title to a patent; it generally takes me two or three days to make up my mind about the wording of a title; not to be so clear as to call the attention of rivals, and enable them to discover the subject, and not so obscure as to incur the danger that a court of justice may afterwards rule, that it is an imperfect definition or title of the invention described in the specification.

Do you see any remedy for that inconvenience?—The remedy is obvious; to make the right of the patentee secure from the time he makes his application; on condition of his then lodging a paper of the heads of his invention—a statement of the principle on which he founds his invention; that is the case in Spain. Another obvious remedy is, that the final specification and description of the means of executing the invention, should be engrossed in the patent itself, so that the title of the patent, instead of being the only means of reference between the two documents, should become a mere indorsement, and a matter of no importance; the latter is done in France. As our practice is now, if the Judges cannot find in the title of the patent what has been called a general index of the specification, the whole patent is set aside. The difficulty of making a correct general index to a work which is not yet composed, must be very great.

What constitutes such a publication during the interval between the application for the patent, and the sealing as to vitiate the patent?—That has never been declared by law, or decided with precision; and my advice to inventors is, to keep their secrets as close as possible. It is supposed that an invention communicated by the patentee to any person whose assistance is necessary to carrying on the invention towards perfecting it, would not be considered as a publication. When an inventor brings his invention to me, and communicates it to me for professional advice, that is no publication; and if he communicates the same to a workman, or to only so many as are fairly necessary, in order to make a machine or a model; but it has never been decided, whether if those persons were to communicate it at second hand, that would be a publication or not; I apprehend it would, though it is probable that the inventor would have a remedy against those persons by action for damages. In the absence of any decision of the Judges, I suppose from the concurrent opinions of counsel of eminence, that such breaches of trust would be considered as publications. It has never come before a court except once, and then I believe the matter was settled in such a way as not to give the positive opinions of the court on the subject. Whenever an invention, or a new article produced by an invention, has passed from one person to another by sale, before the date of a patent, the patent cannot be maintained. There is a decision on this point. The inventor of a new mode of making verdigris, manufactured and sold the article before the date of his patent, which was afterwards set aside in consequence. In this case the invention being the mode of making the article, that invention did not become known by such sale, and therefore the substantial claim to a patent remained; viz. the power of the inventor to withhold his invention from the public.

If a person having made an invention of the same nature as that for which a patent is sought, and has carried it on secretly, is it supposed that the previous secret exercise of the invention will vitiate the patent?—It is decided that the secret exercise of an invention would not vitiate the patent; but then it is assumed that the person so carrying it on secretly, would inevitably reveal the secret the moment that he knew that a patent was applied for, and a disclosure of the secret by him, in the interim between the date of the application and the date of the patent would vitiate the patent; that is the only reason I know, for leaving the patent open to destruction by a publication of the invention, between the date of application and the date of the patent; viz. that those persons who have been previously secretly practising the same invention, may have an opportunity of publishing it, so as to destroy the patent. But such publications, from the fear of an expected patent, rarely takes place, because, when a person applies for a patent, he does not declare himself so clearly by the title, that the person secretly practising the same invention could be certain that it is identical with the previous secret practice.

Is it supposed that the exclusive right given to the patentee will be valid against another party previously exercising the same invention secretly?—It is generally assumed to be so, but I am not aware of any law, or decision upon that point, and it could scarcely come to the test, because the same secrecy that would enable him to have hitherto concealed his process, would also prevent any legal proofs of his having infringed the patent; it is exceedingly difficult to obtain sufficient proof of infringement. Many patents are infringed for years together, without it being possible to obtain any redress, from the difficulty of proving the exercise of the identical invention; that is only the case in a peculiar class of inventions which admits of secrecy; they are mostly chemical operations, where the whole can be done by one or two hands. The Court of Chancery is said to have a right to compel a man to disclose his processes, to inspectors, appointed by the Lord Chancellor to ascertain whether he has infringed a patent or not; I know that the late Lord Chancellor appointed two engineers to go and inspect machinery, but I believe the party consented to the measure and nominated one of them; I never knew such inspection ordered respecting processes; and I doubt the power of the Lord Chancellor to enforce such an order, which would be a nullity if a person did not choose to operate before the inspector, or operated differently from his usual practice; and if he chose to take a machine to pieces and destroy or conceal the parts, there could be no remedy.

Would a more correct specification of a patent invention, make it more easy to prove an infringement?—No; the difficulty of obtaining proof does not depend upon the incorrectness of the specification. If the specification is incorrect, the patent is set aside on that ground; but the specification has no other operation to the advantage of the patentee, than as it is necessary to support the patent right.

Mr. Joseph Merry called in; and examined.

You are a ribbon manufacturer at Coventry?—I am.

Have you any suggestions to offer to the Committee upon the subject of patents?—I am in possession of three patents; one of which I went to trial upon at Warwick, for an infringement, and I was nonsuited upon the specification, for want of the evidence of Mr. Parry, who is the officer that enrols the specification. I exhibited the specification in court; but had not the officer that enrolled it, to prove that it was the true specification, and therefore I was nonsuited. If that had not been the case I should not have succeeded; because the specification was not a good one; and I do not believe there is one in a thousand that is good.

Do you conceive that there is great difficulty in preparing a specification which is sufficient to maintain the patent?—I conceive it is almost impossible.

How does that difficulty arise?—From the difficulty of describing what a jury would consider correctly the nature of the improvement.

Do you conceive that a person who *bonâ fide* wishes to give the public a fair description, has great difficulty in doing so?—I believe it is impossible; I have got three, and I do not believe either of them is good; the last was drawn by Mr. Rotch.

Does the difficulty arise from the specification being drawn up before the machine is actually complete?—No; I think from the difficulty of describing it after it is complete.

In what does that difficulty consist?—They require the specification to be so very minute; for instance, in the case when I went to trial, I had four boards, in which there were a great variety of holes; if there should be more holes in one board than the other, they would nonsuit me upon that, unless I had taken notice of that particular fact.

Do you mean to say that a trifling inaccuracy in some point, not important to the working of the invention, will avoid the patent?—Yes; a point not of the least importance.

Can you state whether a case of that sort would be left by the Judge to the jury, or whether he would decide upon it as a point of law?—I cannot answer that; I have a patent for making ribbon velvets, which has been locked up in my place for five years; the improvement is so great that I can make forty pieces of this article while any other person can make one. Here are two pieces of this article *(producing the same)* one of which is English manufacture, the other is German; the German cost three-pence a yard, and the English cost sixpence; and the German is very superior to the other in point of quality.

Was your patent communicated from Germany?—It was obtained partly by information I have had derived from foreigners and partly from my own invention; I am entitled to a patent for any thing I bring into this country, whether I am the inventor of it or not.

Has that invention been infringed?—I have locked it up, and nobody can do it but myself.

Is your patent for an invention which is identical with the German process?—Yes.

Do you mean that you have not practised the invention?—Yes; because I cannot do it to a profit; because if I were to begin working it, all my neighbours would immediately do the same in defiance of my patent; the specification is not worth a farthing, and I do not believe it is possible to make a specification upon this loom, that will pass in a court of law.

Why not?—From the great difficulty in passing a court of law, and technicality required.

What induced you to take out a patent for this invention, if you have not used it?—It cost me three or four hundred pounds, and I saw the advantage of the thing; and when such a law shall be passed as will enable me to work it with advantage I will work it.

All that you require is a secure patent?—Yes; the patent holds out a security which it does not afford.

Do you mean to say, that if your specification was sufficient, the law would then not be adequate to your protection?—It might; but I do not mean to go to law again about a patent; I would sooner relinquish the patent altogether.

Must it not be necessary, under any system of patent law, to specify the invention?—I think not; I would not have any specification; I think it would be better to send the identical machine by which the thing has been effected, before a proper board, who should take cognizance of that machine; and I think if a man has really a new invention the board ought to have an absolute power of preventing any one from using it for a certain time.

Are there not many inventions in which it would be impossible to lodge the machine itself?—I am not aware of any.

For example, chemical processes?—There it could not be done; but in this case of mine it would be perfectly easy to send up a model, and the board would be able to decide whether any other was like it or not. I have another invention, which I think is deserving of a patent; it is a loom by which I can make six yards of ribbon in the same time in which one has ever been produced in England. Now I should be quite ready to give up the loom itself if I could obtain a secure patent for it.

Do not you think that there would be this objection to your plan, that if you lodge the model of the machine itself, the most trifling change in that machine subsequently would vitiate your claim to the invention?—I think the Board should have power to decide what was an infringement and what was not. I do not at all object to the present payment for a patent, if I can only obtain an effective security, and not merely a nominal one.

Supposing it were left at the option of an applicant to specify on paper, or to lodge a model of his invention, is it your opinion that an applicant would generally prefer the lodging of a model, or would it be too expensive?—I should think they would generally prefer the lodging a model; it is the only way in which any one can decide whether it is original or not.

What is your opinion with respect to the appointment of a scientific commission for the decision of disputes upon patents? —I think it would be very desirable.

Do you imagine from what you know of the manufacturing community, that such scientific tribunal would be generally satisfactory, provided it was impartially appointed?—I should think so.

In the present state of the law, if a person has invented a new pattern of any silk or ribbon, can he protect it?—No; it would be desirable that that should be done.

Has any means occurred to you by which that could be done? —By the same means by which it is done in France. I make a new pattern; I seal it up, and send it to the Chamber of Commerce in Lyons, and that pattern is not opened unless it is infringed upon; if I find any one infringes upon my pattern, I send him before the chamber, and they open the pattern to which I refer, and at once decide whether it is an infringement, or whether it is not an infringement upon that pattern; if it is an infringement, they condemn the loom and the work in it, at once.

How long would you require that protection to be given?—For a twelvemonth would be quite sufficient; but there is no limit to the time there, nor is it necessary, because the thing dies a natural death; for instance, a pattern which is fashionable now would not be so next year; a protection for the season would be quite sufficient. It frequently happens that patterns I have invented are exhibited to the public long before I get them out of my looms; and I do conceive, that unless some protection is afforded in that shape to the ribbon manufacturers, the trade must be lost to the country.

Do some manufacturers go to considerable expense in paying artists for devising patterns?—They have not; but they would do so, if they were protected.

Do not they do so now in many parts of the silk trade?—In London, so far as regards the broad silk trade, I think it is done.

Is it not so in France very generally?—Yes, it is.

Would it be a convenience to manufacturers if they were allowed to take out short patents?—Yes, I think it would. I employ about five hundred people, and they are every one at play at this moment. This art of velvet weaving, for want of protection, is entirely lost to the public.

You propose that it should be left to the option of a person who had discovered a machine, to construct a model, and put that in some public office. Do you think it would not be possible, in the event of a person wishing to infringe the patent, to construct a machine on the same principle, but so different in its appearance, that no jury would be able to say whether the two were identically the same or not?—No, I do not think he could construct a machine that would do the same thing without infringing the principle.

Would the present tribunal afford you security in the event of your depositing a model?—I think it would.

It has been stated by many persons, that even where there are the most accurate drawings it is quite a matter of uncertainty how the jury will decide, because neither the counsel nor the jury are competent to decide whether the machine be new or not. To obviate that, you propose a model; might not the same objection apply to a model?—I do not think it could.

Would you recommend in that case, that the model should be locked up and kept from view, or that it should be open to inspection?—I think it should be kept for the inspection of the board alone. I think there is a great evil in specifications, because they are so easily sent out of the country. I believe any one can have a copy of the specification by paying for it, and therefore, an invention that we have here may be sent abroad with great ease.

With reference to the invention you have mentioned, the specification of which you have stated is insufficient, do you consider that if you were allowed you could so amend your specification of that invention as to make it available?—I do not think I could. I do not think I could make it so that a jury would pass it.

Do you conceive that many inventions are lost to the public from the unwillingness of parties to trust to the protection of a patent?—Unquestionably.

Should you be satisfied, if the law was so amended as to permit your lodging a model, to go now before a court and jury in case an attempt were made to infringe your patent?—I should be perfectly satisfied.

New Patents Sealed in 1830.

To John Rawe, jun. of Albany Street, Regent's Park, in the County of Middlesex, being one of the people called Quakers, and John Boase, of the same place, Gentleman, for their having invented certain improvements in steam boilers, and a mode of quickening the draft for furnaces connected with the same.—Sealed six months for Inrolment 30th March.

To William Aitkin, of Carron Vale, in that part of the United Kingdom called Scotland, Esq. for his having invented certain improvements in the means for keeping or preserving beer, ale, and other fermented liquors.—30th March, 6 months.

Daniel Towers Shears, of Bankside in the Borough of Southwark, in the County of Surrey, coppersmith, for his having invented certain additions to and improvements in the apparatus used in distilling, and also in the process of distilling and rectifying.—31st March, 2 months.

To James Collier, of Newman Street, Oxford Street, in the Parish of Saint Marylebone, in the County of Middlesex, civil engineer, and Henry Pinkus, of Thayer Street, Manchester Square, in the same parish, Gentleman, for their having invented or found out an improved method and apparatus for generating gas for illumination.—5th April, 6 months.

To William Alltoft Summers, of Saint George's Place, Saint George's-in-the-East, in the County of Middlesex Engineer, and Nathaniel Ogle, of Milbrook, in the county of Hants, Esq. for their having invented certain improvements in the construction of steam engines and other boilers, or generators, applicable to propelling vessels, locomotive carriages and other purposes.—13th April, 6 months.

List of Patents

GRANTED IN SCOTLAND SINCE APRIL, 1829.

For an improved method of constructing ships' pintles for hanging the rudder. To John Lichou, county of Middlesex.—8th July.

For a machine or engine for dressing of stones used in masonry by the assistance of a steam engine, a wind, a horse, or a water power. To James Milne, Edinburgh.—4th August.

For certain improvements in the application of elastic dense fluids to the propelling or giving motion to machinery of various descriptions. To Richard Williams, county of Middlesex.—14th August.

For an improvement in the construction and setting of ovens or retorts for carbonizing coals for the use of gas works. To Barnard Henry Brook, county of York.—28th August.

For certain improved machinery for preparing or kneading dough. To Moses Poole, Lincoln's Inn.—28th Aug.

For a certain improvement in the article commonly called stick stealing wax. To Peter Rigby Mason, Middle Temple.—28th August.

For certain improvements in power looms for weaving cloth. To William Ramsbottom, Manchester.—2d Sept.

For certain improvements on machines or machinery for scraping, sweeping, cleaning, and watering streets, roads, and other ways. To John Boase and Thomas Smith, London.—2d September.

For certain improvements on machinery for making lace, commonly called bobbin net. To John Levers, Nottingham.—7th September.

For certain improvements in machinery for propelling vessels, and giving motion to mills and other machinery. To William Pool, city of Lincoln.—16th September.

For certain improvements in steam engines and in machinery for propelling vessels, which improvements are applicable to other purposes. To Elijah Galloway, Borourgh of Southwark.—23d September.

French Patents

GRANTED IN OCTOBER, NOVEMBER AND DECEMBER, 1829.

To Pierre Moreau, at Anvilliers, for a malt mill. 5 years.
— Jean Mathica Bienbar, Paris, for an oil mill. 10 years.
— Jean Henry Tastevin, Alais, for a mechanism to throw silk. 10 years.
— Gally-Gazalat, Versailles, for improvements in acrostatic lamps. 10 years.
— Marie Louis Pierre Lambert, Paris, for improved "Bretelles." 5 years.
— Rodolph Walz, Paris, for an apparatus he calls "hydroconion," or "rain-bath." 10 years.
— Chapuy and Marsaux, Paris, for a static lamp, called "Chronometer." 10 years.
— Barth, Hardy, and Favecrs, Paris, for improved coach springs. 10 years.
— Jean Megemont, St. Etiénne, for a loom batt to weave ribonds. 10 years.
— Sorel Ecouché, for an improved lamp, he calls "Phénomêne Capillaire." 5 years.
— Auguste Groslard and Son, Nevers, for an apparatus to domestic baths. 5 years.
— Trouillier Frêres, Paris, for an improved knife-case. 5 years.
— Mention and Wagner, Paris, for a process to manufacture black enamel. 5 years.
— Jean Rien, Andure, for improvements in silk throwing machines. 5 years.
— Jean Pierre Collain, Sabran, for a curved chimney and heating apparatus. 15 years.
— Joseph Delmontey, Paris, for a lathe to manufactcre cylindrical screws. 5 years.
— Beleurgey, Paris, for an improved powder-horn. 15 years.
— Mazel, Son, and Co. Paris, for a machine to liberate the horse from carriages. 10 years.
— Chaper, Grenoble, for a system of highway roads. 15 years.
— Edward Honké, Paris, for a machine to calender cloth. 5 years.
— Charbonnier-Delage, Paris, for bandages he calls "à la Duchesse." 5 years.
— Jacques Come Jamet, Paris, for a new steel to beat fire. 5 years.

To Jean Francois Courhaut, Chalons, for a hydraulic machine. 5 years.

— John Ogden, Paris, for an apparatus to redress deformities of the body. 10 years.

— Thomas Delisle, Paris, for a balance sieve. 10 years.

— André Maillard, Bordeaux, for a geometrical instrument. 10 years.

— Francois Touchard, Sen. Paris, for an apparatus to prevent the overturning of carriages. 15 years.

— Caplain, Sen. Rouen, for a machine to dress cloth. 15 years.

— Bernard Romain, Bagnols, for a method to learn to read. 10 years.

— Reverchon Sen. St. Etiénne, for a loom to weave at once several ribonds. 15 years.

— Meisonier, Paris, for a process to extract the colouring parts of various ingredients. 15 years.

— Biran and St. Leger, Paris, for a hydraulic cement. 5 years.

— Edward Delarue, Paris, for water-closets. 5 years.

— Louis Gillard, Paris, for typographic characters, in stucco, &c. 5 years.

— Fraise and Vallat, St. Etiénne, for a loom batt to weave ribonds. 5 years.

— Rouvrad and Jouffray, Vienna, for a machine to cut the thread of shawls. 10 years.

— Roque-Ferrier, Paris, for a method to learn the rules of calculation. 10 years.

— John Price, Paris, for a wool spinning machine. 10 years.

— Louis Ferdinand Jacquin, Beauvais, for a moving power. 10 years.

— Millet, Paris, for a portable chimney or fire-grate. 10 years.

— Teste and Campbell, Paris, for a new system of stereotypes. 10 years.

— Favreau, Paris, for paper machinery. 15 years.

— Henry Thèrion, Amiens, for a press to manufacture tiles, bricks. 15 years.

— Réné Monnet, Paris, for an apparatus to burn plaster, coke, &c. 15 years.

— Graff, Liege, for a pump he calls "Le Belge." 15 years.

— Bosq, Giraud, and Tavoil, Auriol, for a system of machinery to make bricks. 15 years.

— Simon Courtiez, Grenoble, for a machine to grind corn. 10 years.

— Cattois and Adde, Paris, for metallic staircases. 15 years.

— Granger, Louviers, for a raising machine in manufacturing cloth. 10 years.

To Chevalier de Curt, Paris, for economical stoves in cast iron. 5 years.

— Le Comte Hueix, Paris, for a process to manufacture white chocolate. 5 years.

— Pierre François Toussaint, Paris, for locks he calls "haplocinite." 5 years.

— Scalabre, Amiens, for a process to manufacture cotton velvet. 5 years.

— Selique, Paris, for a baker's kneading trough. 10 years.

— Silvant, Paris, for a lamp he calls "Silvant lamp." 10 years.

— Sean Marie Souchon, Paris, for a process of dying blue. 15 years.

— Neuhaus-Maisonneuve, Paris, for a baker's kneading trough. 15 years.

— Duparge, Paris, for a liquid soap. 15 years.

— Pierre Rambaud, Eymet, for improvements in the loom batt. 10 years.

— Mackintosh, Glasgow, for a process to increase the combustion of fuel. 10 years.

— Koechlin and Schlumberger, Muhlhausen, for a winding machine. 10 years.

— Viviant and Son, Paris, for a system of coaches he calls "an impulsive." 10 years.

— John Byrne Madden, Passy, for a steam-coach. 10 years.

— Pierre, David, Nimes, for a loom to weave several pieces at once. 5 years.

— Breton and Rouilly, Lyons, for improvements in Jaquart looms. 5 years.

— Chretion and Sourd, Lyons, for a ribbon-loom. 5 years.

— Gtitton and Eynard, Paris, for a lamp, the call "spiral lamp." 5 years.

— Dizé, Paris, for an ink he calls "Asphaltic." 5 years.

— Leckien, Rouen, for a machine to split dyewood. 5 years.

— Vavasseur and Lenoir, Paris, for an artificial fur. 5 years.

— Plalaret and Benoit, Paris, for a process to dye cotton fast black. 5 years.

— Bauzon, Versailles, for a pruning knife. 5 years.

— Delacoux, Paris, for an improved guitar. 5 years.

— Joseph Roullet, Lyons, for a loom batt with several shuttles. 5 years.

— John Dixon, Benfeld, for a warping mill. 5 years.

— Baignel, Lyons, for a system of navigation on rapid rivers. 15 years.

— Brown, Paris, for an improved harp. 15 years.

— Carpentier, Paris, for improvements in sick beds. 15 years.

— Hervieu, Nantes, for a new filter in refining sugar. 10 years.

To Guilbert, Paris, for improvements in combs. 10 years.
— Walle-Stacs, Steemberck, for a moveable pulpit. 5 years.
— Oudinot-Latel, Paris, for horse-hair stuffs, 10 years.
— Bouveret and Cordier, Paris, for a harmonical flute, 10 years.
— Jacobi and Vanny, Rome, for a process to extract the indigo. 15 years.
— Dumont (Julien) Paris, for improvements in the shiste, to clarify sugar. 15 years.
— Charles Thomas, Paris, for a plunging apparatus. 15 years.
— William Denton, London, for a steam coach. 10 years.
— Dégoussée, Paris, for tools more economically to sink artisan wells. 10 years.
— Joseph Verden, Paris, for a new sort of bread, &c. 10 years.
— Chaussenot, Paris, for a new fire-place or stove, with regulator. 10 years.
— Ribourt Senior, Paris, for metallic almanacks. 5 years.
— Jorez & Co. Paris, for improvements in oil cloth and varnished leather. 5 years.
— Frichot, Paris, for a process to manufacture ornaments and marble, 5 years.
Etienne Lasgoriux, Paris, for improvements in his kneading trough. 10 years.
— Charles Guigo, Lyons, for an improved loom, 10 years.
Nicolas Bidermann, Lyons, for a plaster mill. 10 years.
— Desmant's Son, Paris, for improvemeuts in his "aqua pede." 5 years.
— Boyer and Boujade, Beziers, for improvements in stills. 5 years.
— Abbott, London, for improved machinery to felt. 15 years.
— Antoine George, Lyons, for a threshing-mill. 10 years.
— Portal, Bourdeaux, for a new boiler to steam navigation. 15 years.
— William Newton, London, for improvements in Lever's bobbinnet machine. 15 years.
Nicolas Sulot, Dijon, for a new harmonical table. 15 years.
Galy-Casalet, Versailles, for improvements in his acrostatic lamp. 10 years.
— Pimont, Dawretab, for a process to spin wool without oil, 5 years.
— Trulfaut, Paris, for improvements in hanging rudders. 5 years.
— Dudos, Paris, for an universal clock. 5 years.
— Jean Joseph Fayard, Paris, for a method of measuring firewood. 10 years.
— D'Hardivillier, Paris, for a process of oil-paint, he calls "autochrosie." 10 years,

To Chaussenoit and Alliette, Paris, for a hamp of a level of water. 10 years.

— Jean Pierre Mengeant, Pontaudemer, for boilers with hollow feet. 15 years.

— Brian Adams, London, for improvements in constructing cannons. 15 years.

— Philippe and Montibland, Paris, for machinery to manufacture carriage-wheels. 15 years.

— Lahove, Toulouse, for a baker's kneading trough. 10 years.

— Abraham Jaccond, Lyons, for improvements in carriage-wheels. 10 years.

— Bernard Briest, Troyes, for a machine he calls "additionnair." 5 years.

— Le Roy-Barré, Sedon, for cardes in strong leather. 5 years.

— Pierre Fase, Paris, for a stoppage to carriages. 10 years.

— François Crozel, La Chatte, for a mill for throwing silk. 15 years.

— Oudinet-Lutel, Paris, for improvements in horse hair stuffs. 10 years.

— Samuel Dalton, Paris, for improvements in manufacturing buttons. 15 years.

— Charles Dien, Paris, for metallic circles to globes. 5 years.

— Sellique, Paris, for a moveable bottom to baker's ovens. 10 years.

— Le Blanc Marconnoy, Paris, for a kitchen apparatus.

— Bronzac, Paris, for an apparatus he calls "chimney with moveable fire-place."

— Jaques Tuilliere Junion, Auch, for a contimual distillery. 15 years.

— Leture, Paris, for a calorifire. 15 years.

— Jaques Nicolas L'Epine, Paris, for an apparatus to light apartments. 10 years.

— Joseph Dyor, Manchester, for a machine to coil the cotton on bobbins. 15 years.

— Anton Reybert, Paris, for a process to dry all sorts of wood and timber. 5 years.

— Dulac-Delapierre, Paris, for a process to manufacture bread. 5 years.

— Chaumette, Paris, for a new set of playing cards. 15 years.

— Rousseau, Paris, for a method to make shoes with woollen or cotton stuffs. 5 years.

CELESTIAL PHENOMENA, for May, 1830.

D.	H.	M.	S.	
1	0	0	0	before the Clock ☉ 3 *m* 1 Sec.
2	15	0	0	☽ in conj. with τ in Leo.
3	3	0	0	☽ in conj. with β in Virgo.
3	18	0	0	☽ in conj. with η in Virgo.
4	6	0	0	☽ in conj. with 1 χ in Virgo.
4	21	0	0	☽ in conj. with δ in Virgo.
5	0	0	0	before the Clock ☉ 3 *m* 28 Sec.
5	0	0	0	♃ Stationary.
6	4	0	0	☿ in conj. with 1 A in Taurus.
6	6	0	0	☽ in conj. with κ in Virgo.
7	12	2	0	Ecliptic opposition or ○ full moon.
8	0	0	0	☾ in conj. with γ in Libra.
9	3	0	0	☾ in conj. with φ in Oph.
10	0	0	0	☉ before the Clock 3 *m* 49 Sec.
11	16	0	0	♂ in conj. with γ in Capri.
12	7	0	0	☾ in conj. with d in Sagitt.
13	11	0	0	☾ in conj. with 2 β in Capri.
14	11	0	0	♂ in conj. with δ in Capri.
15	0	0	0	☉ before the Clock 3 *m* 56 Sec.
15	0	0	0	♅ stationary near δ in Capri.
15	4	18	0	☾ in □ or last quarter.
16	7	0	0	☾ in conj. with λ in Aquarius.
16	17	0	0	☾ in conj. with φ in Aquarius.
18	12	0	0	☾ in conj. with ♀ long. 11° in Pisces. ☾ lat. 2° 7′ S. ♀ lat. 1° 33′ S. diff. of lat. 34.′
20	0	0	0	☉ before the clock 3 *m* 49 Sec.
21	8	19	0	☉ enters Gemini.
21	19	13	0	Ecliptic conjunction or ● new moon.
22	6	0	0	☽ in conj. with α in Taurus.
24	8	0	0	☿ 132° in Taurus.
25	0	0	0	☉ before the clock 3 *m* 37. Sec.
27	11	0	0	☽ in conj. with ξ in Deo.
28	17	0	0	☽ in conj. with ρ in Leo.
28	22	48	0	in □ first quarter.
29	21	0	0	☽ in conj. with σ in Leo.
30	0	0	0	☉ before the Clock 2 *m* 53 Sec.
30	90	0	0	☽ in conj. with β in Virgo.
31	1	0	0	☽ in conj. with η in Virgo.
31	12	0	0	☽ in conj. with 1 χ in Virgo.
31	21	0	0	♀ in conj. with ο in Pisces.

The waxing moon ☽.—the waning moon ☾

Rotherhithe. J LEWTHWAITE.

METEOROLOGICAL JOURNAL, for March and April, 1830.

1830.	Therm		Barometer.		Rain in inches.
	Hig.	Low	High.	Low.	
Mar.					
26	69	34	30,47	30,41	
27	70	28	30,50	30,42	
28	67	29	30,40	30,30	
29	67	28	30,13	30,06	
30	65	28	29,99	29,96	
31	62	30	29,80	29,70	
April					
1	43	29	29,69	29,68	,425
2	41	30	29,56	29,40	,125
3	39	31	29,76	29,16	,7
4	42	24	30,12	29,99	,025
5	46	19	30,12	30,02	
6	58	19	29,95	29,74	
7	55	37	29,81	29,79	
8	65	39	29,74	29,52	
9	64	36	29,43	29,42	
10	55	37	29,54	29,36	,35
11	53	39	29,60	Stat.	
12	55	40	29,59	29,45	,275
13	56	38	29,85	29,69	,025
14	63	31	29,95	29,91	
15	61	46	29,76	29,65	
16	66	46	29,66	29,60	,025
17	62	46	29,64	Stat.	,075
18	61	36	29,80	29,75	,1
19	54	38	29,63	Stat.	
20	56	36	29,80	29,56	,025
21	56	33	29,85	29,56	,025
22	54	43	29,54	29,39	,025
23	55	47	29,30	29,22	,225
24	57	44	29,56	29,16	,25
25	58	32	30,06	29,88	

EDMONTON. CHARLES H. ADAMS.

THE

London

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No. XXVII.

[SECOND SERIES.]

Original Communications.

ART. III.—ON HEATING AND VENTILATING HOT HOUSES.

To the Editors of the London Journal of Arts, &c.

GENTLEMEN,—Of all plans hitherto adopted for heating hot houses, that by means of boiling water seems to have obtained a decided preference. Various alterations and improvements have taken place since the origin of the system, but all the projectors have gone, and still go, upon the supposition that a cistern, with returning pipe or pipes are absolutely necessary, and which consequently renders the apparatus more complicated and expensive than the plan of heating by boiling water requires.

The last and greatest improvement upon this system of heating, is allowed, I believe, to have been made by Mr. Weeks.*

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* For a description of Week's Patent, see page 83.

His plan is to have a broad, flat, thin pipe, extending from the boiler to the far end of the house, with ledges raised upon the top of it, for the purpose of retaining water thereon and producing vapour; at the end of this pipe is a small cistern, and into this cistern not only one pipe is introduced, but two returning pipes; one of great and another of smaller dimensions, either of which is to be used at the discretion of the gardener. Now it appears to me, that by proper management, the system requires neither cistern, returning pipe or pipes, nor water retained upon the top of them for producing vapour, and that the present plans (if I am not mistaken) are far, very far, from being the best that the system of heating hot houses by boiling water is capable of being reduced to.

I do not wish to depreciate the ability of so deserving a man as Mr. Weeks, whose plans are so highly spoken of in that excellent publication, the Gardener's Magazine, but having, as I think I have, discovered a more effectual and less expensive method, I cannot withhold my improvement upon the system from the public, although my plan may interfere with those of professional projectors upon the subject, it is original, and infringes upon none which have hitherto preceded it; and now I shall endeavour to exemplify my views upon the best method of heating hot houses by boiling water, and also of ventilating them when the temperature is too high, by the accompanying sketches, (see Plate V.) and a very short description of the same.

Fig. 1, is a cross section of the hot house and back shed, taken through the pit wall opposite to the boiler at the end of the hot house; fig. 2, is an elevation of part of the front of the pit, shewing the hot water pipe resting upon cast iron brackets, which support the coping, and also the fire flue, with brackets in front, supporting a string course of stone; fig. 3, is an elevation of the ventilator, shewing the shutters half open; *a*, is the boiler; *b*, *b*, *b*, the hot water pipe; *c*, *c*, the vapour tubes; *d*, *d*, the flues; *e*, the string course of stone laying over the flues; *f*, iron brackets which support the string course, the pipe, and the coping in front; *g*, four inch brick work round the pit; *h*, *h*, the coping of the pit wall.

In reference to the ventilating apparatus, *i*, *i*, *i*, are the shutters; *k*, *k*, *k*, apertures in the brick wall, opposite to each sash of the hot house; *l*, *l*, *l*, the connecting rods for moving all the shutters simultaneously; *m*, *m*, loops through which the connecting rods pass; *n*, a rack at the end of the connecting rod, which is acted upon by a toothed segment *o*, upon the lever *p*; and *q*, is a pinion taking into a similar toothed segment at the opposite end of the lever *p*, which pinion is worked by a winch *r*, shewn in fig. 1.

First, of Heating.—The furnace and boiler may be placed behind any part of the back wall, at the option of the architect; he may also indulge his fancy in the direction of the fire flue, supposing at the same time that he is conversant in the erection of boilers and fire flues. And here I beg leave to observe, that gentlemen, out of nine cases in ten, had better employ men of experience in those matters, than become self-acting architects, as is too much the case at present.

The boiler may be of the usual size and form, suitable to the extent of space intended to be measured, by the fire flue and boiling water; but it must have its top firmly covered, and in the cover a light self-acting valve, very easily worked, that a little steam may be retained upon the surface of the water, which gives a little quicker motion to the water flowing through the pipe; I say pipe, for I have only one pipe in the whole apparatus: the upper aperture in the boiler to be placed six inches below the top, and from this point begins the pipe, of six inches bore, laid perfectly level, which will convey the water in any direction whatever, and to every part of the house, if desired; and the returning end of this pipe may be thrown into any part of the boiler near the bottom, say twelve inches below the upper aperture, which twelve inches of fall, it is scarcely necessary to observe, must be given by an elbow in the pipe, and this elbow may be placed in any part of its course, providing that the architect carefully observes to increase the length of the vertical tubes, hereafter described, should he place any between the elbow and the boiler, in the returning end of the pipe; that is to say, he must in all cases make those tubes as high as the top of the boiler.

The pipe may be composed of castings, either flat, square or round—say in four feet lengths, with an aperture in each, or every other casting, of the same size as the bore of the pipe, or any lesser aperture, if preferred, with a tube, standing as much above the top of the pipe, as the top of the pipe is below that of the boiler, to prevent the water from running over; these apertures give air and motion to the water, and serve at the same time to admit any quantity of vapour into every part of the house; and when they are not wanted to give out vapour, or when they emit too much, they may be covered or stopped up, at the discretion of the gardener, leaving, however, two or three open to give vent to the rotative motion of the water. The pipe may be placed various ways in the house, but I shall place mine, (as I intend building one for my own use), on the wall of the pit, as shewn in the section, supported by thin brackets of cast iron, resting upon a string course of stone above the fire-tiled flue, leaving the front open, and also a sufficient space round the pipe, that the heat emitted therefrom may diffuse itself through every part of the house; and over the pipe, and above the top of its tubes, I shall place the coping of the pit wall, which rests in front, upon the same brackets as the pipe, and at the back upon a four inch wall of brick, as shewn in the elevation and section; which coping will be thoroughly heated by the pipe and its apertures when the furnace is at work; and, when once heated, together with the heat of the pipes, will keep up the temperature of the house, after the furnace has ceased to work, a much longer time than any plan hitherto adopted.

Should the gardener wish at any time to give the vines a good steaming, by entirely filling the house with vapour, the above plan is well calculated for doing it, and requires nothing more than stopping the supply of water to the boiler, and reducing the surface of water to two or three inches below the upper aperture in the boiler; and by keeping down the safety valve when the water is boiling, he may steam in any way, or in any part of the house he pleases, by keeping such vapour tubes open or shut, as best suits his purpose.

Second, on Ventilation.—The most general method of ventilating hot houses, is by opening the top and front sashes, which practice is attended with much trouble, and sometimes with danger to the vines, should sudden squalls of wind and rain come on unexpectedly when the sashes are open, and more particularly where only one gardener is kept.

The plan I propose to adopt, is to have an aperture through the back wall, twenty inches in height by fifteen inches in width, opposite to each sash, and these apertures are to be placed at the top of the house, whatever height the house may be, opening into a back shed, which is to extend the whole length of the hot house; two thirds of this shed in length must be left open in front, and the roof supported by pillars; the remaining parts, and both ends of the building, must be enclosed by a solid wall from the foundation to the height of the eaves, but both ends of the building, from the eaves upwards, must be left quite open, to give a free circulation of air; and, if thought necessary, a few old fashioned dormer windows might be made in the roof. In this shed the furnace and boiler will be placed; it will also answer as a store house for coals and other articles, and it is evident that the roof will check the sharp cutting winds from the north, so much complained of by gardeners, and against the plan of ventilating through the back wall of a hot house, without at all impeding a free circulation of air through these apertures into the hot house, when the sliding shutters, which I propose to adopt, are open.

These sliding shutters, which are intended to run in grooves at top and bottom, may be placed either in the hot house or in the back shed; and I propose that the whole of them, as per elevation, be connected together for ventilating one house, whether such house be large or small; so that if one is moved by the machinery, when the winch is turned, the whole will open at the same time, and this can be done almost instantaneously, to any degree the gardener may require.

The method is very simple, and I presume will be easily understood, by referring to the elevation and section. I should recommend the shutters and machinery being fixed in the back shed, and let the axle of the pinion wheel extend through the wall into the hot house, and project two or three inches from the face of the wall, for the purpose of working the winch, and the gardeander may, without going out of the house, regulate the shutters to any degree he pleases, almost in an instant; and should there be two houses adjoining to each other, two segments may be worked upon a common centre by the same pinion, right and left, with each of their connecting rods and shutters, by making the axle of the pinion to slide from one segment to the other, or by what is technically termed, throwing it in and out of gear; by this plan no sliding top sashes are required, and all their pullies, cords, weights, catches, &c. &c. are avoided, and the ugly appearance of their descending cords, weights, &c. are dispensed with.

I need scarcely mention, that the front sashes of a hot house may be worked upon the same principle as the back shutters, if required; and as the connecting rods are so small, they would be almost invisible, if they were fixed to the stiles of the shutters exactly opposite to the cross bars of the windows, and they would be out of the way of every thing; and the sashes would be worked with greater accuracy, and less danger than by hand, and the whole house ventilated, front and rear, in a minute of time, however large or small such house may be; and in almost any house the connecting rods might be made to pass the stems of the vines, without doing the least injury to any thing, or disturbing any pots or other things which may be placed on the sill of the windows.

The back shutters may be made of three quarters of inch boards; each shutter consisting of two boards, with a tongued and grooved joint in the middle, and the connecting rods may be of the same material, two inches broad, screwed to the shutters, which will serve as battens to brace and strengthen them; so that in point of economy, nothing can be cheaper or less expensive than this plan of ventilating hot houses, and the plan is as well adapted for circular iron roofs as it is for the straight pitched ones.

If the connecting rods to the shutters were of thin wrought iron, rounded on the lower edges, instead of wood, running in loops, and not allowing the shutters to rest on the lower groove, they would work easier; and as the price of iron is reasonable, I think it preferable, and would recommend iron instead of wood.

I am, Gentlemen,

Yours, &c.

GEO. KNOWLES.

Ripon, Yorkshire.

ART. IV.—ON THE PROPOSALS FOR CHEAP PATENTS.

To the Editors of the London Journal of Arts.

GENTLEMEN,—There appears to be an opinion among a considerable class of persons, that it would be desirable to have patents granted at a very cheap rate, on the ground that their high price acts prejudicially in checking and smothering invention. That high prices do in some measure act as a check upon the multiplication of patents is true, but it does not thence follow that it checks invention, for many inventions are better paid without a patent than they would be with one; and it is not desirable that inventors of every class and degree should take patents for their inventions. Therefore high price or some equivalent check, instead of being injurious, is quite necessary to restrain those from rushing into the career of patentees, who are not provided with means for pursuing it with a prospect of advantage to themselves and to the community.

Useful inventors are of three classes; the first are men of genius, capable of producing important inventions that involve the entire projecting of new machines or remodelling of existing ones, and the organization of new or complicated processes and systems of working. These are very few.

The second are men who have not so extensive a scope of imagination and intellect as to project new systems or great changes, and to organize the means of effecting them, but who are capable of making marked improvements upon existing systems and machinery, or partial changes in them. This class is considerable.

The third class is made up of men of small imagination, who are not capable of any great originality of thought, but who have a certain ingenuity which they can apply to the things that come within the range of their observation, and possess a tact for correctly and accurately executing that which they conceive. Their province is to improve in detail, to give a finish to the detached parts of the extensive combinations formed by superior minds, and to fill up the chasms that occur frequently in the plans of the greatest inventors. Happily this class is immense, being spread thickly over the whole body of mechanics, from the manufacturer and engineer down to the lowest workman; such men constitute expert mechanicians, who are never at a loss for expedients for overcoming the practical difficulties of detail that occur in their business, and are perpetually making trifling inventions which they require for immediate application.

Now the first and second of these classes are the only ones that do much good, or gain much by taking patents for their inventions, because it is only those two classes who produce inventions having a sufficiency of originality or quantity of invention, to make them clearly definable as distinct property, and to give them an inherent value individually.

The third class are restrained from taking patents for their inventions, some because they know well that their inventions are not worth patents, and others who are too vain or ignorant to be aware of that fact, because of the high cost of patents. And it is well that they are restrained, for their inventions are seldom or ever worth patents in the hands of poor men, even if those patents could be had for nothing; because in general no one invention of that class would give, individually, an additional value worth notice to the machine or process to which it is applied.

The reward which inventors of this class obtain, is in the superiority which they gradually acquire over their competitors in business, and the consequent increase of employment or profit, and that is likely to be fully equivalent to the value of their inventions.

Trifling inventions do sometimes rise into value as patents, and become very beneficial to the public, in the hands of manufacturers who have money and connection. But then that value is not the inherent value of the inventions themselves, which would have been as nothing in the hands of poor men, but it arises from their being made the medium for a beneficial application of capital, and the chief merit due to the inventors is not for their skill as artists in having made the invention, but for their activity and energy as tradesmen.

Of this there are several examples. For instance, Bramah's pen-holders, Mordan's pencil-cases, Felton's knife-sharpeners, &c.

In these cases the inventions themselves were trivial, and probably neither of those patents, if offered for sale in the beginning, would have brought £.50, because the chief profit to be made by them was not due to any thing the invention itself possessed, but to the capital and skill and activity which the manufacturer would devote to making and keeping a trade, for which the invention and patent were only a ground-work.

A poor man might have had either of those patents, and never have made any thing by it, even if the patent had been given him for nothing, but they are all said to have grown into considerable trade in the hands of the individuals who held them.

I come now to the principal pointon which the advocates of cheap patents hold themselves strong, viz. the case of a man of real genius, great imagination, and vigorous mind, who having made a valuable discovery, is unable from poverty to procure a patent, and is therefore obliged either to give up his invention for nothing, or to bury it for ever in his own mind. Such cases may occur; but they are rare.

In general, if the author of an important invention is found among the ranks of the poor, doubtless he will have more difficulties to cope with than if he were rich, but if he be really a superior man, and of a cast to produce inventions that are worth cultivation for their own strength, the price of a patent will not prevent his invention from being brought forwards, because he will find wealthier men to assist him. And if he has not enough address and skill in the world to do that, how will he have enough to force his invention into use, against opposition and difficulties of every kind, even should you give him a patent for nothing, and a bonus besides? I marvel much that this point should still need argument, and in truth it is waste to argue about it, when we have examples that set the question at rest.

Some of our greatest inventors have been absolutely poor men, and others, if not poor, were at least both unwilling and unable, in the beginning of their career, to risk themselves the price of a patent, and the expenses of subsequent trials; and cases are daily occurring of manufacturers paying the expenses of patents and experiments for their workmen, for a share in the patent right of an invention they have thought valuable. A considerable portion of the patents taken out in the manufacturing districts, are on this footing, which shews that the difficulty of union between capitalists and inventors has been much exaggerated.

After all, the advocates of cheap patents make a much more mighty stumbling block of this first cost of a patent than it really is, and they seem to consider it as the great impediment to invention; which being removed, invention would flourish with a luxuriance hitherto unseen. Now the real cause which under the present law represses invention and makes capitalists loth to speculate in inventions, is the uncertainty which reigns through every stage of a patent, from the beginning to the end; uncertainty, first, whether the invention will answer, and secondly, whether the patent will stand the brunt of an action at law, through which ordeal it will surely have to pass, so soon as it has become profitable to the inventor. Both of these points can only be settled at great expense, and it is the fear of that expense, and not the first cost of a patent, which deters men from taking up the inventions of others and ought to deter all prudent men of small means from attempting to take out patents and work them at their own risk.

If patents were given for nothing, many poor inventors would injure themselves by neglecting their proper occupations for the imaginary rewards held out by a patent, and very few would be any the forwarder for it, for the simple reason that forcing inventions into use, does require and will require under any law that can be contrived, money as well as invention, and therefore those who have not money should not undertake it.

To sum up, the men whom the law should invite to devote themselves to invention and to take patents are, first, those who have skill to produce considerable inventions, and who have either themselves money to try their inventions and bring them to bear, or address to induce richer men to join them; and, secondly, those who if they can only produce trivial inventions, have means and commercial skill to found trades upon them.

But those who have small invention and no money, ought to be discouraged from taking patents by check of some kind.

That check is now high price, and if it be removed some, other must be applied in its place.

I am, Gentlemen,

Your obedient servant,

R. S.

Recent Patents.

To William Clutterbuck, *of Ozlebrook, near Stroud, in the County of Gloucester, Shear-maker, for his having invented certain Improvements in the Shears used for cutting or cropping of Woollen Cloths, and other Fabrics requiring shearing.*—[Sealed 21st Nov. 1829.]

SPECIFICATION.

"My improvements in the shears used for cutting or cropping woollen cloths and other fabrics, apply to the old construction of hand shears, or to those employed in the machines called Harmers; which improvements consist, first, in a new shape or form given to the edge of the uppermost blade of the shears, commonly called the runner blade; second, in an improved construction and adaptation of springs connecting the blades, in place of what is commonly called the bow of the shears; and third, in a new mode of adjusting the set or position of the edges of the blades of the shears to each other.

"The new form given to the runner blade, as first above mentioned, is intended to prevent the injury frequently sustained by the scraping of the edge of the runner blade of the old shears, upon the face of the cloth (generally termed beating), which injury is caused by the edge of the runner blade (standing nearly perpendicular to the bed) pressing or rubbing up the face of the cloth after it has given a cut, and is in the act of springing back or returning.

"In my improved shears, I make the edge or cutting part, commonly called the plank of the runner blade, as nearly horizontal and coincident with the bed on which the cloth is placed as I conveniently can, consequently when the blade springs back off the ledger blade, after having cut or cropped the pile, it presents to the face of the cloth a nearly flat smooth surface, and not the cutting edge, as heretofore. This will be fully understood by referring to the drawings (see Plate V.) in which fig. 4, is a section taken through the two blades of the shears, in a vertical direction ; *a*, is the fixed or ledger blade, and *b*, is the moveable or runner blade, shewing the bent shape of the blade, and the cutting edge at *c*, which being seen in the following figures of the drawings, require no further explanation, as the form must be obvious by inspection.

"The second head of my improvements consists in the construction and adaptation of springs to the shears in a new way, one of which is a coiled spring to be applied at the shanks or ends of the blades, and the other a mode of attaching bow springs to the upper sides of the blades, in place of the springs or bows commonly affixed to the shanks, by which improved construction of spring, I am enabled to take apart the blades of the shears when required, for the purpose of repairing or grinding, without injury to the springs, or heating the bow, which must be the case in grinding the ordinary shears. Figs. 5, 6, 7, and 8, are several representations of the improved shears, with the new construction of coiled spring, which I purpose to place at the shanks or ends of the blades ; *a*, is the ledger or fixed blade, with its shank piece *e*, and leaf *f* ; *b*, is the runner or moveable blade, with the coiled or convolute spring *d*, *d*, extending from its shank, and which convolute spring is to be firmly screwed or bolted to the shank *e*, of the ledger blade, by connecting the two leaves *f*, together, as at fig. 5, which is a top view of the shears, the two blades being put together ready for working. Fig. 6, is a side view of the same. Figs. 7, and 8, are top views of the blades, when taken apart.

" The other method, viz. that of applying bow springs to the backs of the blades, is shewn in figs. 9, 10, 11, and 12, in which fig. 9, is a plan or horizontal view of the shears, with their springs attached, ready for work. Fig. 10, is an end view of the same; fig. 11, a view of the face of the runner blade, shewing the mode of attaching the springs thereto, and fig. 12, is a vertical section, taken across the shears; *a,* is the ledger blade; *b,* the runner blade; *c, c,* two bent springs, attached at one end by screws or bolts to the top side of the ledger blade, and at the other end by an adjustable nut or screw at the front of the runner blade.

" By these modes of placing the springs, the inconvenience of the bow of the old shears is obviated, and the shearing frame consequently takes much less room, and I am enabled also to operate upon the cloth nearly the whole length of the blades at one cut.

" I propose to communicate the required motion to the runner blade of the improved shears, shewn in figs. 9, and 10, from a small crank on the frame or carriage of the shears, which is to be actuated by an endless band from those working parts of the frame that give motion to the crank of the ordinary shearing machines. From the crank on the side of the carriage of the shears, the motion may be communicated by the connecting rod *h,* attached at one end to the crank, and the other to the lever *i,* on the end of the shaft *j,* which works in bearings in the ends of the arms or pieces *k, k,* projecting from the upper side of the ledger blade. Upon the shaft *i,* is the small drum *l,* over which is passed the strap or band *m,* and connected at the other end in the usual way to the lever or " bob" *n,* which bob or lever is also connected to the ledger blade *a*, by the strap *o*, and adjusting screw *p*. It will be seen by this arrangement of the parts, that the blades may be made to cut nearly from end to end, as no part of the shears comes in the way of the bed or the cloth.

"In order to prevent the runner blade from springing off the ledger blade, I cause the hooked part of the adjusting stop *p*, on the arm *k*, to be brought up to the back of the runner blade, which will prevent the blade springing too far back.

"The third head of my improvement, viz. the manner of adjusting the set of the blades of the shear, will be understood by reference to figs. 6, 10, and 11.

"In fig. 6, it will be seen that on the shank *l*, of the ledger blade a link or ring, *r*, is shewn with the end of a lever *s*, bearing in it also; on the shank is the hook of the adjusting screw *t*, which passes through a hole in the lever *s*, and by screwing up the nut on the screw, the strain on the lever and shank of the blade will slightly bend the shank, and by that means alter the set of the runner blade; which by this contrivance may be adjusted to the greatest nicety, without giving any strain to the blades or springs. The manner of adjusting the set of the shears, having the springs on the top of the blades, is shewn in figs. 10, and 11, where the end of each spring is connected to the runner blade by a screw bolt *u*, working in a slot in the blade, with an arm *v*, extending from the side of the spring, into which the worm of the screw *g*, works as a nut; the screw being supported and kept in its place by the frame *w*; by turning the screw *g*, the blade may be raised or lowered and the set of the shears adjusted at pleasure.

"Another plan of adjusting the springs, which may be used with the former with good effect, is shewn in the vertical section, fig. 12, where the spring is seen with its end in the socket x, fastened on the upper side of the ledger blade, and by turning the adjusting screws y, z, the spring may be moved backward or forward, and by that means the blade adjusted.

"As there are some parts herein described for the purpose of rendering my invention better understood, which are not new, and which I do not intend to claim, I wish it to be particularly observed, that my invention consist, first, in the new shape of the runner blade as described, by which a flat surface is presented to the cloth when off the ledger blade.—Secondly, in the new constructions or forms of springs, as described and shewn in the figures, and in the mode of applying the same to the blades of the shear.—And lastly, in the manner of adjusting the set of the shear blades, as above described."—[*Inrolled in the Rolls Chapel Office, January,* 1830.]

Specification drawn by Mr. Newton.

To George Straker, *of South Shields, in the County of Durham, Ship Builder, for his invention of an Improvement in Ship's Windlasses.*—[Sealed 25th July, 1829.]

The object of this improvement is to work a ship's windlass, with greater ease and expedition than upon any of the plans at present in use, and consists in a certain piece of mechanism attached to the windlass and the employment of a peculiarly formed handspike to work the same.

SPECIFICATION.

"Plate V. fig. 13, is a perspective view of the windlass, fitted with my said improvement on the starboard or sheet anchor side, but it may be as well here to observe, that it may if required be equally well fitted to the larboard side, or to both if thought necessary; *a* is the paul bit; *b*, is the bit head; *c, c,* is the windlass barrel; *d*, is a cogged band or rack round the windlass barrel, and *e*, is a pinion working into the said rack; *f*, is the axle on which the said pinion is fixed, and is supported at one end by the bit head, and at the other end by the paul bit; *g, g, g, g,* are four circular metal plates with ratchets or teeth cast on or rivetted to one side of each of them, as at *h, h, h, h,* in the auxiliary detached figs. 14 and 15, and which shew the improved parts, on a larger scale. These ratchets are fixed firmly in pairs on the axle *f*, about four or five inches asunder; the teeth on each plate, must be set exactly to correspond; and it is then by means of a peculiarly shaped handspike hereinafter described, that I act upon these teeth or ratchets, forcing round the pinion *e*; and thus act with great power upon the rack *d*, which of course turns the windlass barrel round.

Fig. 16, is a representation of the peculiarly formed handspike: the lower part from the point marked *m*, is made of iron, and is forked at *l*, and is furnished with two shoulders, one on each side, as at *n*; now if one of this sort of handspikes be introduced between each of the two plates, *g, g,* which form a pair, the fork *l*, being allowed to bestride the axle *f*, the shoulders will rest upon and act against the ratchets *h*, on both sides, and if these handspikes be only worked up and down, like a pump brake, they will force the axle *f*, round, and thus turn the barrel of the windlass, while the loss of time occasioned by removing the handspike of the old form when hove down, and hitting the hole on the upper square again at every fetch, will be avoided.

"It is evident that this improvement of the ratchet plates and forked handspikes is equally applicable to the main axle of the windlass barrel, and to the axle of the pinion *e*; and it may be proper to observe, that the ratchet plate or wheel may be made single and worked by a handspike placed astride of it.

"Now whereas, my said improvement, when applied as here shewn to the axle of a pinion, (which I consider the most efficacious mode of applying it) may be made to ship or unship in the bearings of the axle, or to slip in or out of gear with the pinion at pleasure. And whereas the ratchet plates may be made of cast-iron, or of wood strapt with iron, or otherwise. But whereas, I claim as my invention, the ratchet plates marked *g*, and *h*, whether applied to the axle of the pinion, as here shewn, or to the main axle of the windlass barrel, as before mentioned; and also the forked handspike to be used therewith, which two articles together, used for the purpose of giving additional power to a ship's windlass, constitute my said improvement and invention, and such my invention being, to the best of my knowledge and belief, entirely new, &c. &c."—[*Inrolled in the Inrolment Office, September*, 1829.]

Specification drawn by Mr. Rotch.

To William Church, *of Heywood House, near Birmingham, in the County of Warwick, Esq. for certain Improvements in and upon Instruments for sharpening Knives and other Edge Tools, and in the Machinery or Apparatus for manufacturing the same.*—[Sealed 15th October, 1829.]

SPECIFICATION.

"My improvements in or upon instruments for sharpening knives and other edge tools, and in the machinery or apparatus for manufacturing the same, consists in the adaptation of two or more peculiarly formed file cut pieces of steel, which pieces of steel may be conveniently mounted on the handle of a fork, or other handle, or in any other way that circumstances may require.

"Plate VI. fig. 1, is a face view of one of the said pieces of steel, shewing several indentations, and also the file cut surface, and the aperture through which the shank of the handle passes. Fig. 2, is an edge view of the same. Two of these steel pieces, formed as shewn in the drawing, having indentations made exactly to fit each other, are placed nearly in connection in fig. 3, and joined together in fig. 4; both of these figures representing the pieces in section.

"The two pieces of steel, when thus united, may be confined by passing the shank of an ordinary fork through them, when by resting against the boss the pieces are secured firmly between it and the handle, as shewn at *a, a,* in figs. 5, and 6, by the ordinary means of attaching handles to table forks.

"I form these sharpeners, by cutting dies, of whatever dimensions may be necessary, out of thin sheet steel, and give them the file surface by means of dies in a stamping press, and afterwards harden them in the ordinary way of hardening steel tools.

"When I employ the instrument as above described to sharpening scythes and such like tools, I set them in guards, where they are secured and held together by a screw, as shewn at fig. 7.

"It is to be observed, that in the drawing, figs. 1, 2, 3, and 4, represent the sharpeners as circular pieces, on a scale sufficiently large for sharpening scythes; but when the instrument is to be applied to a table fork, it should correspond, or nearly so, with the size and shape of the ornamental part of the shank of the fork, whatever that may be.

"The apparatus for manufacturing these said improved sharpeners, consists of peculiarly formed conical dies. These dies are cut with indentations corresponding and fitting into each other, in order to cut and mould the pieces of plate steel into the required forms, for producing the sharpening tools above described. The conical part of the lower or female die is file cut, by means of which the face of the steel disc is similarly impressed; the upper or male die is formed as its counterpart, excepting the file surface.—[*Inrolled in the Rolls Chapel Office, April,* 1830.]

Specification drawn by Mr. Newton.

To JOHN BRUNTON, *of West Bromwich, in the County of Stafford, Engineer, for Improvements in the Apparatus for manufacturing Coal Gas and Coke; and also Improvements in the Method of arranging such Apparatus.*—[Sealed 2d October, 1828.]

SPECIFICATION.

"MY improvements consist, first, of retorts made of cast iron, and not cased or lined with fire clay; of a conical shape, for the purpose of facilitating the discharge of the coke at the larger end, when the retorts are fixed in a vertical position with that end downward; thereby saving much labour and inconvenience in the discharge thereof, and also preventing the injury which is occasioned by the breaking and reducing to powder, a portion of the coke attendant upon the ordinary method of discharging retorts. Secondly, in the adaption of a perforated pipe, of a conical or other convenient shape to the retorts, for the purpose of enabling the gas to escape freely through the mass of coal when it is of such a nature as to make it desirable to facilitate the escape of the gas by some such means. Thirdly, in an improved furnace or fire-place door or mouth. Fourthly, in a contrivance for preventing the breaking or disturbance of flanches or joints by the expansion and contraction of the hydraulic main, or the pipes leading thereto. Fifthly, in improvements in the arrangement of various parts of gas apparatus; which arrangements, and also the improvements in the various apparatus, are set forth in the annexed drawings and the explanations thereof. (See Plate VI.)

" Any convenient number of my retorts may be connected together or placed in beds; but I have in my drawings, confined myself to a set or bed of twelve retorts, considering that that number will be generally useful and advantageous.

" The same letters or characters refer to the same parts in each of the drawings, and illustrate each other.

" Fig. 8, is a ground plan of a bed or set of twelve retorts; fig. 9, shews the mode of connecting the mouth pieces of the retorts; fig. 10, is a cross section of the apparatus, taken vertically; and fig. 11, a sectional plan of the upper end of fig. 10, taken at the dotted lines.

" Fig. 12, is a general elevation, shewing the thoroughfare under the beds of the retorts for the purpose of discharging, &c.; fig. 13, exhibits the bottom cover or stopper of a retort; fig. 14, the perch or support of the coal within the retort, and fig. 15, a measure that may be used in charging the retorts.

" The ground plan, fig. 8, represents a double bed of retorts, containing six in each, which are marked *a*, *a*: A, is a wall of fire-bricks passing between the two beds, and is supported by a sleeper K, as shewn in fig. 10; B, B, are two furnaces heating the two beds of retorts through the flues c, c, c, c, which passing along the outside of the retorts, unite and return between them into the main flue leading to the chimney, as is shewn more distinctly in fig. 11.

"Fig. 9, shows the manner in which the mouth pieces are connected together, viz. by means of bolts and screws passing through the flanches, *d, d, d, d.* Two flanch pieces, *e, e,* extend beyond those of the retorts, resting on the piers, E, E, the outer part of which flanches marked *q,* form supports for the bottom of the flues.

"Fig. 10, is a cross section taken in the dotted line, fig. 8, shewing its elevation, with stand, pipes, hydraulic main, &c.; A, is the wall dividing the two beds of retorts; D, D, are the two outside walls or arches connecting the two piers E, E, (see fig. 12). Under these arches are two walls F, F, supported upon sleepers G, G, and containing four stoppers, T, T, T, T, for the convenience of withdrawing, in order to clear out the flues. The four conical retorts are marked *a, a, a, a,* the lower ends of which are shewn with their covers in various positions; *j,* the lower cover or stopper of a retort, (seen more distinctly in fig. 13). The mode of attaching it to the mouthpiece is shewn, but I do not claim any particular mode of doing it; *f,* a perch or support for the coals within the retort, which is attached to a rod *g,* and passes through the cover *j,* and is secured at the proper height by the screwed cap *h.*

"The perch is shewn more distinctly in fig. 14; *n,* an upper cover, which when placed on the top of the retort and luted in the usual manner, is kept down by the pressure of the lever and weight *o,* upon the centre of it; but which in case of a stoppage in the pipes, allows it to act as a safety valve and thereby prevent mischief. The end of the lever opposite to the one carrying the weight is attached to the support *p*; *b.* a perforated pipe inserted into the retort for the purpose of facilitating the escape of gas when generating from small coal; it is kept in its place at the bottom by the perch *f*, and at the upper end by the cross bar *m*; H, H, H, H, figs. 10 and 12, represent the furnace doors; the entrance to each furnace consists of a frame and two doors meeting in the middle and there forming an angle, as shewn in the drawings, the one door opening upwards and the other downards.

"The lower door is opened when the fire-place wants cleaning; the upper door is opened for the purpose of introducing fuel, a portion of which lies against the door, preserving them in a great degree from the action of the fire, and at the same time preventing the escape of a portion of heat; W, the ash pit, in which is placed the water trough X; I, I, I, I, are cover titles resting on the upper flanches C, C, &c. and upon the walls A, and D.

"To prevent any expansion of the hydraulic main, or the pipes leading thereto breaking or disturbing the flanches or joints connected therewith, instead of supporting the hydraulic main in the usual manner by means of an inflexible column or standard, I interpose or place between the hydraulic main and the upper part of the column or standard, a crutch or bearer, the lower part of which is allowed to press upon one end of a compensating lever, to the other end whereof a weight is attached. These levers and weights are so proportioned to the weight of the hydraulic main as to allow the crutch upon the upper part of which the hydraulic main rests, to move up and down with it, and thereby prevent the inconvenience which might otherwise arise.

"As a further means of preventing injury from the expansion of the pipe, I fix to the hydraulic main a requisite number of dip pipes, each of which descends about three inches into the liquid contained in the main; and through these dip pipes to about the same depth in the liquid, the H, pipes are passed so loosely as to allow the liquid to form an hydraulic joint between them; and therefore render a stiff and inflexible joint of the hydraulic main and the pipes leading into it unnecessary, and allow them to expand and contract by a change of temperature without occasioning any inconvenience.

"In the drawings, figs. 10, and 12, *r*, is an aperture in the upper end of the retort through which the gas passes into the stand pipes; *s*, a stand pipe; *t*, the pipe usually called H, pipe, leading from the stand pipe *s*, to the hydraulic main; *a*, a branch and bonnet in the middle of the pipe *t*, for the convenience of cleaning it; *w*, the hydraulic main; *x*, a dip pipe fixed to the main, and through which the end of the pipe *t*, passes so freely as to allow the liquid to form an hydraulic joint between them.

"The particular parts I have now described, and the advantages of my arrangement of them, will be evident, from an examination by any person of ordinary attainments, of the figs. 10, and 12. The thoroughfare under the beds of retorts for the purpose of discharging them with considerably less labour (and with less injury to the coke) than by any other means: together with the furnace mouths H, the ash pit W, and water trough X, are distinctly shewn in fig. 12. The retorts with their covers, and the mode of securing the upper cover, so as also to make them serviceable as safety valves, is distinctly shewn in fig. 10. The hydraulic joint connecting the hydraulic main and pipe leading into it, and also the crutch and compensating lever, are fully illustrated by the figures 10, and 12.

Fig. 15, the vessel which I use for charging the retort, is made of proper capacity for containing the charge of one retort, and when placed over it, by withdrawing a sliding bottom, which is fitted to it for the purpose, the contents are emptied into the retort.—[*Inrolled in the Inrolment Office, April,* 1829.]

Specification drawn by the Patentee.

To Angelo Benedetto Ventura, *of Cirencester Place, Fitzroy Square, in the County of Middlesex, Professor of Music, for his having invented certain Improvements on the Harp, Lute, and Spanish Guitar.* —[Sealed 21st. February, 1828.]

The subject of this Patent is a newly constructed musical instrument with strings, combining the principles of the harp, lute or lyre, and the guitar in one instrument, by which the treble strings may be stopped upon finger boards, for the purpose of producing the higher notes of the musical scale.

The instrument may be constructed in various ornamental forms: that shewn in Plate VI. at fig. 21, is principally recommended. The middle of the instrument has the ordinary strings of the lute, but on the side are the finger boards and strings of the guitar, and additional strings and finger boards for producing the highest notes.

It will be unnecessary to describe the construction of the instrument further, as the figure above alluded to renders it perfectly evident, and as to the method of playing upon it, that may be readily conceived to be in a great degree similar to the fingering of the lute and the guitar of the ordinary constructions. The peculiar feature of novelty claimed, consists in the combination of the two instruments in one.—[*Inrolled in the Inrolment Office, August,* 1828.]

To John Tucker, *of Hammersmith, in the County of Middlesex, Brewer, for his having invented or found out an exploding Shot or Projectile.*—[Sealed 2d Nov. 1829.]

The subject of this invention is a sort of bomb shell or rocket, to be shot from a cannon, and which is intended to explode when it falls or comes in contact with any obstruction. The bomb or rocket consists of a hollow iron vessel, of an egg form, which is to be filled with gunpowder, and in connection with the powder there is a fusee or match which ignites by percussion, caused by the recoiling blow of a bolt or piston, placed loosely within the hollow cylindrical tube which constitutes the tail of the rocket, with wings on the outside to guide it. The Patentee describes the invention in the following words:—

" My invention consists in a projectile, which bursts by means of percussion powder, and which powder receives the necessary blow to cause it to explode, from a loose bolt, which when the projectile is passing through the air, remains at the hinder part of a tube made to receive it, but the instant the projectile meets with any sudden check or impediment, such as striking against a target or the object it is aimed at, the bolt rushes to the forward end of the tube, where the percussion powder is placed with such violence as to cause an immediate explosion.

" Plate VI. fig. 16, represents a longitudinal section of my said projectile; *a*, is the head or magazine; *b*, is a screw plug, through which the magazine ia charged with powder; *c*, *c*, are two of the fans or wings to guide the projectile, or keep it straight, on the principle of the feathers of an arrow; *d*, *d*, is along hollow space or chamber, cast in the hinder part or tail of the projectile, to receive and keep steady the tube *e*. This tube is screwed in the projectile at *f*, and contains the loose bolt and percussion powder, as shewn more clearly in the next figure.

" Fig. 17, is a section of the tube *e*, supposed to be unscrewed at *f*, drawn out of the projectile; *g*, is the loose bolt or hammer which gives the blow on the percussion powder; *h*, is a screw plug, one end of which forms a nipple *i*, on which the percussion powder is placed or tied. In this figure it is represented as put in a small bag, and tied over the nipple; *j*, is a piece of quick match, drawn through two holes pierced in the tube *e*, to serve as vents.

" It will be observed, that the screw plug *h*, has two screw threads cut on it, *k*, and *l*; the former screws into one end of the tube *e*, and the latter into the magazine or end, *f*, of the projectile; *s*, is the end of the tube closed.

" In order to prepare this projectile for use, the bolt, percussion powder, and quick match should be arranged, as shewn in fig. 17, and then screwed into the projectile, as shewn at fig. 16, which is a section of fig. 18, the front end being represented at fig. 19, and the back end at fig. 20.

" The screw *b*, should then be removed, and the part *a*, filled, should be replaced, and the projectile being then put into a canvass case, tightly fitted, is ready to be put into the gun to be shot off. It is only necessary to observe, that the feather end should be next to the powder in the gun.

" It may be fired from an ordinary cannon like other shot, and the effect will be as follows; while the projectile is passing through the air, the bolt *g*, will remain at the hinder end of the tube, having of course the same impetus as the other parts of the projectile, but the moment the impetus of the other parts receives a check by striking against the object aimed at, the impetus gained by the bolt, will carry it forward along the tube *e*, to the nipple *i*, where it will bring up or strike with such force as to cause the fulminating powder to explode and communicate with the gunpowder in the part *a*, which will of course instantly burst to pieces in various directions.

" It is scarcely necessary to state that the fusee or quick match is merely to keep the gunpowder in the chamber or head *a*, from passing into the tube *e*, through the vent holes.

The Patentee in conclusion states, " I claim as my invention, an exploding shot, or projectile, the explosion of which is caused by fulminating powder being struck by a bolt or hammer, which derives its force from the impetus given to the missile by firing it from the cannon, but the impetus of the bolt continues after that of the other parts of the projectile has ceased or is checked.—[*Inrolled in the Roll's Chapel Office, April,* 1830.]

To **JAMES SOAMES**, **Jun.** *of Wheeler Street, Spital Fields, in the County of Middlesex, Soap Maker, for a new preparation or manufacture of a certain material, produced from a vegetable substance, and the application thereof to the purpose of affording light and other uses.*—[Sealed 9th September, 1829.]

THE subject of this Patent is a mode of preparing cocoa nut oil, for the manufacture of candles, in which operation an oil is extracted for burning in table lamps, and the materials when so prepared are be found much purer than common tallow or sperm oil, and to afford a more brilliant and colourless light than any other oleaginous material hitherto applied to the purposes of illumination. The following are the words of the

SPECIFICATION.

" MY invention or discovery consists in preparing or manufacturing the material or substance commonly called cocoa nut oil, by subjecting it to the process of hydraulic or other suitable pressure; by which process I separate the elaine, by which I mean the more fluid part from the stearine, by which I mean the more solid part, and thereby obtain two products; one fit to be applied to the manufacture of candles, and the other to burning in ordinary lamps, and other purposes.

" I take the substance called cocoa nut oil, in the state in which it is imported into this country, and submit it to a strong hydraulic pressure, (the size of press I use being of ten-inch ram), having made it up in small packages, three or four inches wide and two feet long, and one or one and a half inches thick. These packages are formed by first wrapping up the said substance in strong linen cloth, of close texture, and then in an outward wrapper of strong sail cloth. The packages are to be placed side by side, in single rows, between the plates of the press, allowing a small space between the packages for the escape of the elaine.

" The temperature at which the pressure is begun, should be from about 50 to 55 degrees, or in summer as nearly at this range as can be attained, and the packages of the said substance intended for pressure, should be exposed for several hours, previously to about the same temperature: when the packages will no longer yield their oil or elaine freely at this temperature, it is to be gradually raised, but it must at no time exceed 65 degrees, and the lower the temperature at which the separation can be effected, the better will be the quality of the oil expressed.

" When the packages are sufficiently pressed, that is when they will give out no more oil, or yield it only in drops at long intervals, the residuum in them is to be taken out and cleansed or purified, which I do by melting it in a well tinned copper vessel, which is fixed in an outer vessel, having a vacant space between the two, which is closed at the top, and into which steam is admitted, and the heat is kept up moderately for a sufficient time, to allow the impurities to subside; but if a still higher degree of purity is required, it is necessary to pass it through filters of thick flannel lined with blotting paper.

" Having been thus cleansed or purified, it is fit for the manufacture of candles, which are made by the ordinary process used in making mould tallow candles. Having thus disposed of the stearine, or what I call the first pro duct, I proceed with the elaine or oil expressed from it and which I call the second product, as follows; that i to say, I purify it by an admixture, according to th degree of its apparent foulness, of from one to two pe cent. by weight, of the sulphuric acid of commerce, of about 1.8 specific gravity, diluted with six times its weight of water; the whole is then to be violently agitated by mechanical means, and I prefer for this purpose the use of a vessel constructed on the principle of a common barrel churn; when sufficiently agitated, it will have a dirty whitish appearance, and is then to be drawn off into another vessel, in which it is to be allowed to settle, and any scum that rises is to be carefully taken off. In a day or two, the impurities will be deposited at the bottom of the oil, which will then become clear, or nearly so, and it is then to be filtered through thick woollen cloth, after which it will be fit for burning in ordinary lamps, and other uses; sharpening instruments on a hone, oiling clocks, and the like.

" Now the process of separating the elaine from the stearine by pressure, in manner aforesaid, has never before been applied to the substance called cocoa nut oil, and consequently no product has heretofore been obtained hereby from that substance fit for being manufactured into candles, in the ordinary way, or for being refined by any of the usual modes, so as to burn in ordinary lamps, both which objects are obtained by my method of preparing or manufacturing the said substance.

"And I therefore hereby claim as my invention or discovery, the manner hereinbefore described of preparing or manufacturing the substance called cocoa nut oil, by hydraulic or other suitable pressure, and the application of the products obtained thereby; one to the purpose of making candles, and the other to the purpose of burning in ordinary lamps, without the necessity of applying the conductors of heat, and other contrivances now adopted, when cocoa nut oil in its ordinary state, as imported, is used for burning, and also to other uses."—[*Inrolled in the Inrolment Office, March,* 1830.]

We have seen some of the candles made from the above material, and from our own observation are enabled to state, that they are a very superior article. The light produced is more brilliant than from the same sized candles made of tallow; the flame is perfectly colourless, and the wick remains free from cinder, or any degree of foulness during combustion. There is no smoke, and not the slightest disagreeable odour, while the candle is burning, and very little when extinguished.

These candles are much whiter than those made of the purest tallow, and appear to burn longer, and extremely even, without any appearance of guttering, although exposed to drafts of wind, or carried up and down stairs. The retail price of them, we understand to be ten shillings per dozen pounds, which, though higher than tallow, will no doubt come into very extensive use from the circumstance of their great superiority. We have not seen the oil burning, but understand that it possesses the same estimable properties as described to belong to the candle, and is not more expensive than sperm oil.—EDITOR.

To JOHN M'LEOD, Esq. *of Westminster, in the County of Middlesex, Surgeon of the Madras Establishment, for his having invented Improvements in preparing or manufacturing certain substances so as to produce Barilla.*—[Sealed 10th August, 1829.]

THE Patentee being in the East Indies, and accustomed to the pursuit of chemical science, observed certain substances produced in that country, and considered to be of little value, which he conceived to be capable of useful application as a substitute for barilla; and having made the necessary experiment, he was convinced of the fact; and has therefore taken this patent for the application of his discovery, and the method of preparing the material: which is described in two or three lines toward the close of the specification; commencing with a concise history of the circumstances which led to the discovery which he gives in the following words:—

"Travelling along the coast of Coromandel, at certain seasons of the year, the ground in many places is observed to be covered with a white efflorescence, which on examination will be found to consist chiefly of muriate and sesqui-carbonate of soda. These substances are collected by the natives and used by them for a variety of purposes.

"The ground on which this efflorescence appears, is never covered with verdure. The soil is a deep sand with a mixture of clay, carbonate of lime, &c. The clay contains, as it generally does, some oxide of iron, of which whole fields on the west side of the great Pulicate Lake, forty or fifty miles north of Madras, are of this description.

"Carbonate (sesqui-carb.) of soda is met with only on the surface, and it is found in greatest abundance a few weeks after the periodical rains have ceased. The natives begin collecting it in March, and continue to do so during the hot weather that succeeds. The saline crust is scraped from the surface, mixed with sand and clay, washed in water so as to separate some of the insoluble matter, and the watery solution is evaporated to dryness. The residuum thus obtained, is the karum of the bazaars, and is the only preparation hitherto made or used in India of these materials.

"This karum contains from four to six or eight per cent. of soda, and the rest consists of carbonic acid, sand, clay, muriate of soda, decomposed vegetable matter, and occasionally other impurities. Various attempts have been made to introduce this substance into our manufacturies, and with this view consignments of it have at different times been sent from Madras, but the nature and quantity of its impurities effectually excluded it.

"Some years ago it occurred to me, that if it were divested of some of its insoluble matter, and submitted to the action of fire so as to free it from a portion of carbonic acid, decomposed vegetable matter, water, sulphur, and other volatilizable impurities, it might become an article of considerable importance. I conceived that if the karum were treated in this manner, and fused in a reverberatory or other furnace, it might be converted into a substance resembling barilla, which would be found a perfect substitute for that article. This idea I soon after put in practice, but my first attempts were unsuccessful.

"The materials above mentioned being fused in a reverberatory furnace, became a mass of green glass, in consequence of their containing a quantity of silecious matter, of which they had not been sufficiently divested. It therefore became necessary to get rid of this admixture by more careful solution and evaporation to dryness, as already mentioned. These operations being performed with sufficient care, the residuum underwent the action of fire without any sensible portion being converted into glass, and the fused mass being withdrawn and cooled, resembled very fine barilla in most of its essential properties; and in fact passes current in the London and Antwerp markets as barilla of a superior quality."—[*Inrolled in the Inrolment Office, October,* 1829.]

AMERICAN PATENTS.

For an Improvement in the manufacturtng of Gentlemen's Stocks.—G. R. Lillibridge, *New York.*

The foundation, or stiffening part of this stock, is formed of two pieces, joined together lengthwise, say of doubled buckram. They are to be so joined that they move on each other, as on a hinge, and are hence called "Hinge Stocks." When thus formed, they are to be covered and lined in the usual way. The buckram may be rendered waterproof by shellac varnish. The claim is to "the composition, and manner of forming the hinge, by which the two component parts of the foundation of the stock are united together, by which the same is rendered sufficiently pliable, without the possibility of becoming displaced by ordinary wear."

For an Improvement in making Combs.—Eli Sperry, *New Haven, Connecticut.*

A QUILLED back comb is to be made of wood, the grain running with the teeth of the comb; a tube of metal, the bore of which exactly fits the back of the comb, is then drawn over it, and cemented or not, as may be thought best; there must, of course, be an opening along the tube to allow for the thickness of the teeth of the comb. The claim is to "the hollow wire tube."

On the 14th of April, a patent was obtained by Nathaniel Bushnell of Connecticut, for manufacturing quill backed combs of wood, by making the back and teeth in separate parts, with the grain in each running longitudinally, the part forming the teeth being let into a groove in the back; this appears to us preferable to the plan now proposed.

There is not any drawing accompanying this specification; the patentee may say that it can be perfectly well understood without one; but the law says, "and shall be accompanied with drawings and written references, whenever the nature of the case admits of drawings."

For a Machine for Cleaning the Dirt, &c. from Seed Cotton; James Gilliam, *Carrol County. Tennessee.*

A HOLLOW drum, of six feet in length, and 20 inch diameter, is made to revolve, in the manner of a bolting screen; but with its axis horizontal. Its periphery is formed by slats of wood, extending from end to end, and having a space of about half an inch between them. This drum is contained within a trough, or box, and rests upon friction rollers, upon which it revolves, as it is without gudgeons. A shaft extends through the centre of the drum, and is supported upon gudgeons outside of its heads; four boards are affixed by their edges to the shaft, and extend the whole length of the inside of the drum, forming wings, or leaves, standing at right angles to each other; upon the edges of these wings are placed, obliquely, flat pieces, to serve as conveyers, causing the seed cotton to pass from one end of the drum to the other. The shaft, with its wings, revolves much more rapidly than the drum. The cotton is put into a hopper, and in passing from one end of the drum to the other, is cleaned.

For an improvement in the Application of Power to Machinery; Robert Mitchell, *Cynthiana, Harrison county, Kentucky.*

This patent is for one of these outrages upon the A, B, C, of mechanics, which might astonish us were they not so frequently perpetrated. The screw of Archimedes is to be made to elevate iron balls of 200 lbs. each, which are to fall upon a bucket wheel, near its top, and be delivered at the bottom into a trough, down which they are to run into the "Elevator." "The power of one horse will run the elevator with twelve balls, weighing 2,400 lbs.; this weight applied on the side of a wheel 30, or any other convenient number of feet in diameter, may be applied to the running of any kind of machinery," says the patentee, and no doubt he is correct, provided his machinery does not require more than the power of half a horse to turn it.

If power is to be thus gained, why fatigue and feed the horse?—a little of this swindled power may as well be applied to the turning of the elevator, and the circulating medium of iron be thus rendered perpetually current.

Diorama.

The proprietors of this unique exhibition have presented the public with two new pictures, which in point of excellence may, beyond all dispute, be ranked among the finest specimens of the art.

The interior of Rheims Cathedral, though in a great degree destitute of the elaborate ornaments of the florid Gothic, presents nevertheless a magnificent display of architectural grandeur; and this has been so excellently depicted by the artist, in his admirable disposition of light and shade, that the imagination can scarcely believe the scene to be other than real. The minute parts of the picture have been treated with no less skill than the general *ensemble*, and as compared with its predecessor, the interior of St. Peter's at Rome, is in our opinion decidedly superior.

The view of Mount St. Gothard, at the *Passage aux Roches*, as a landscape, cannot be spoken of in terms equal to its merits. The dark, over-hanging rocks of the fissure between the mountains, from whence the spectator is supposed to look, contrasted with the snowy tops of St. Gothard's in the distance, produce an effect truly sublime, which as a faithful representation, can only be appreciated by those who have visited such magnificent displays of nature, in her most romantic forms.

With great pleasure we congratulate the artist on the present happy effects of his labours, convince that few have equalled—none excelled him.

REPORT

Of the Select Committee of the House of Commons on the Laws of Patents.

(Continued from page 112.)

Mr. John Farey further Examined;

You have said that where a man's secret is betrayed, he may have an action for damages; are you aware of any case in which such an action has been brought?—I have some confused recollection of proceedings many years ago; I cannot recollect whether it was an action, or a bill in Chancery; it was for a breach of trust; that is the only instance that I know of any proceedings upon such a subject; it was between Smith and Dickinson, I think, in 1803.

I find, on examination into that case, that the person who committed the breach of trust did not publish the invention, but took out a patent for it in his own name, and kept it for his own benefit, instead of for the joint benefit of both parties, as he had promised to do. £.300 damages was awarded in the Court of Common Pleas, and the patentee was also compelled to assign the patent to plaintiff. The validity of the patent obtained under those circumstances was not decided; but as it was probably bad or suspicious, the damages might, in the intention of the court, be a compensation to the plaintiff for impairing his right to the patent, which was assigned at the expense of the patentee, and therefore if it had been good, that would of itself have been compensation.

What means have the public of becoming acquainted with the fact, that an application for a patent has been made before the patent is sealed?—None whatever; but individuals who choose previously to lodge a caveat, will certainly have information of any application that may be made for a patent, in terms corresponding to those of their caveats. No publication of applications is made.

Can you give the Committee any information with respect to the caveat?—The caveat has no other operation in favour of the person who lodges it, than that which ought to be given to the public at large, by advertising the application for a patent in the Gazette; it gives notice to parties who have foreseen that they shall want notice.

Of what benefit is it to the person who enters that caveat?—If he require to have notice of a patent being passed, that caveat will give him notice.

Is it not a request that information should be given to him of an application for a patent?—Yes; a patent cannot pass through the office where a caveat has been lodged, without notice being first given to the person who lodges the caveat.

Supposing he opposes the patent, what steps does he then take?—If the ground of his opposition is, that he has practiced the same invention before, or has a previous patent for it, he may cause the Attorney-General (or Solicitor-General, according to which office it is in) to summon the parties, and the Attorney General, after examining the respective inventions, decides whether they are so dissimilar that the patent is to pass, or not; that course applies equally, whether the opposing party previously had the invention in common use without any patent, or whether he has a new invention in hand, for which he proposes to take a patent, or whether the invention has been surreptitiously obtained from him by the applicant, or whether the opponent has already taken a patent. The caveat has the same effect as the standing order of Parliament, whereby a notice must be given in consequence of an application to Parliament for any private bill; but with this difference, that there the notices must be given, in due time, to all parties interested, whereas in this case it leaves parties to foresee that they shall want notice, and to provide for obtaining such notice by lodging a caveat.

Will you explain what protection it is to a person applying for a patent to lodge a caveat?—In general, it is no protection whatever. If a patentee, after having disclosed his invention to some agent, or associate, or patron, before applying for a patent, has a suspicion that such person might be applying for a patent himself, at an earlier period than he, the inventor, was ready with his application, then by lodging a caveat, he would have notice and detect the treachery, before it was too late. I know no other use that it is of. When persons apply to me for my advice respecting a new invention, and ask whether they should or should not lodge a caveat, I inquire particularly, if they have ever communicated it to any person except myself, if they say no, then I take no caveat; if they have communicated it to any other person, I inquire into the particulars, and if there is the least probability that opposition, or rivalry, may ensue from those parties, then I recommend a caveat; because otherwise those parties may apply for a patent before we can; except in such case, the lodging the caveat might be a bad measure, by calling attention to the inventor's proceedings; for although he may conceal his name by using that of an agent, still his application for a patent is not so likely to get known, as his caveat; because any person can be informed at the offices what caveats are entered, but not what patents are applied for, and in progress; unless they have entered caveats, and have notices in consequence of them, they cannot learn at once what patents are going through the offices.

Would not the effect of a previous caveat be to debar the original inventor from taking out a patent?—No, the caveat makes no opposition of itself; it merely causes notice to be given to the parties that such a patent is applied for, and will pass if not opposed; there are no proceedings upon the caveat itself, further than the clerk of the Attorney-General, or other office where a caveat is lodged, sending a notice; I have had such notices continually, but my caveats are now commonly lodged in the names of solicitors or patent agents; because I am often out of town, and the notices require immediate attention.

Supposing the case of two applications for a similar invention, would not the effect of that be to destroy the right of either party?—The only decision upon that is, that the first applicant is to have the preference; it would be scarcely possible that two should apply at the same instant of time; and priority of application is preferred to priority of invention, this is, assuming each one to have invented independently of the other. If one is a plagiarist, the true inventor would have the preference, although he was not the first applicant; that is, supposing he desired to have a patent; if not, then, according to my notion of the spirit of the existing law, the first applicant who is able, and willing, to make the disclosure of the secret, ought to have the patent, that is to be given as the price of such disclosure The first inventor ought to have the refusal, and if he declines it, then the first applicant should have it; but in all cases the disclosure is to be induced, either by the recompence offered by the grant of a patent, or by publication made in time to vitiate an expected patent, about to be granted to another. I cannot say that this is the established practice, for as far as I can judge from what I have seen, no two Attorney-Generals have had the same view of the subject. There is no authority whatever in writing to go by.

In giving a preference to the first applicant, it is assumed that the invention has not been practised openly by either?—Upon any person proving to the Attorney-General that an invention has been publicly practised before he would refuse the patent altogether.

In case an applicant for a patent was aware that some one else had turned his mind to the same subject, would it not be of service to that person to lodge a caveat, in order that he might have notice if his rival made previous application for a patent?—That is the common case of a caveat being lodged, but it can do no great good in most instances. If a new invention is getting up so much in secrecy, that none of the rivals are informed of its existence, then a caveat has only the effect of calling attention to the subject; but if attention has been already called to the subject by other means, then a caveat has the effect of procuring a notice of any rival application.

What is the form of the caveat?—The form of a caveat runs, "Caveat against a Patent being granted to any person, or persons for any invention (in the subject of inquiry, for instance) in cotton spinning, without previous notice being given to Mr. ————," that may be the real person or any agent; the address where to direct the notice, is all that is essential as to the person.

How long does that caveat run?—Six months.

What is the expense?—The expense is five shillings at each office; and there are three offices where caveats may be lodged.

Suppose that there are two applications for a patent, and the Attorney-General informs the parties that the inventions are the same, and awards the patent to the first applicant, is it not in the power of the rejected applicant, on receiving that information, to effect such a publication as will destroy the patent right?—It is in his power; but I never knew an instance where the Attorney-General did declare that there was such a similarity and equality of rights to a secret invention, as to induce him to refuse granting a patent; he has sometimes advised the parties to join their interests in one patent, when he felt difficulty in deciding, and has informed them that by contending at law, their patents, if he allowed them both to pass, would probably destroy each other. In the case of Lieutenant Parker's carriage drag, the opposition that I mentioned before, which was heard on the 8th and 9th of December, the patent having been applied for in June, it was supposed at the time of that opposition that his patent was very near its completion, and the other inventor, who had conceived the same or a similar idea, having been in the habit, some years before, of consulting me, and my brother, came up to London to apply to me. The moment he opened his papers, I said, that looks so very like to a plan which I have in trust, that I cannot undertake to advise you; but if you think of going on, apply to Mr. Millington, which he did. In that case, the person making the opposition, knowing from what I had said, that there was probably great similarity, proposed to Lieutenant Parker to make it a joint patent, to which I should have agreed on his part, if the second invention had grown up from equal date with the first; but as I thought it came too late, and when we ought to have been out of the reach of opposition, if no delay had taken place, I refused, because I expected I could prevail on the Attorney-General to quash the opposition, as coming too late; the opposing party therefore prepared to be ready to publish the invention the moment the Attorney-General should say they were the same, so as to destroy the patent, which would otherwise have debarred him from using his own invention. The Attorney-General, however, after hearing and rehearing several times, decided that there was such a similarity as to make it a case of difficulty, but that there was not such a similarity to justify him in refusing the patent; in consequence, the opponent, thinking there might yet be novelty in his plan, reserved it, to see whether when Lieutenant Parker's specification was lodged, that there would remain any difference, or invention worth his taking a subsequent patent. In this same case, the Attorney-General said, that as there was so much similarity, Lieutenant Parker must give him a drawing of the drag that was exhibited, to keep by him, in order that he might have a check against any more invention being put into the final specification, than what had been exhibited at the hearing; that was an extra and unusual expense, to require such drawing, and a hardship to forbid the patentee from making further improvements in the details of carrying his invention into execution, during the term allowed for preparing his specification. It has since that time been clearly decided by the Judges, that an inventor has a right to make further improvements during that period, so that he does not superadd any new principle, that decision was respecting Clegg's patent in January last.

Is the Attorney-General the sole judge between two patent applicants?—He is; he summons the parties before him; they bring their drawings and models, engineers, witnesses, attornies or agents to explain; and sometimes, if it is requested, he will go and visit the machinery.

Does not the sort of decision he is called upon to pronounce, require considerable knowledge of mechanics?—It requires a very deep knowledge, to form a decision between the merits of the respective inventions, particularly as the inventions at the period when they must necessarily be exhibited to the Attorney-General, are seldom organized in that state of perfection that will enable him to judge by results only. Inventors can rarely have any chance of making their ideas intelligible to the Attorney-General, and hence they are obliged to employ some professional man who can devote more time, and more readily make out what they mean by their imperfect models, drawings or descriptions, and then attend the Attorney-General to explain for them. I have been thus in the habit of attending all the successive attornies-general since the time of Sir Vicary Gibbs, but was never required to leave any drawing or description, except once, by Sir William Garrow, and in the case last mentioned.

Can you state whether it is the practice of the Attorney and Solicitor-General, in cases of difficulty, to call in any assistant by way of an assessor?—It is not the practice, and I should doubt the propriety of his exercising such a power, if he possesses it; because an inventor would think it very objectionable that his inventions should be communicated without his consent, further than to some public officer, such as the Attorney-General, who can have no interest in it, or else to a confidential professional man of his own election.

Is it not an inconvenience that a question between two concurrent applicants should be decided by a person, perhaps, not very competent to decide such a question?—It is not felt an inconvenience, from the circumstance that the Attorney-General almost always sees sufficient ground of new invention, to grant the patent, or both, if two are applied for; therefore the oppositions become of no effect, and I never recommend any for that reason; the result is, that a man can get a patent for any thing, unless it be a notoriously old invention, and even then very slight alterations will make it appear new to a person unacquainted with inventions.

So that it is a mere formality?—Yes: if any of the attornies-general that I have attended (unless the present Lord Chancellor might be excepted) had attempted to exercise a judgment between contending inventors, it would have been very mischievous in frequent cases, and never any good; the patents being at all times subject to be annulled by a court of justice, if not found to be good in every respect; the Attorney-General recommends the King to grant the patent almost uniformly; and upon the same assumption, if there are two applications for patents for very similar inventions, he allows both patents to pass, when there would be a chance on very close inquiry, by competent judges, of finding collision. It is usual to advise the parties to join in a patent, but nothing more. If the invention has been communicated, so that they have sprung from a common origin, and if there is some proof of that communication, justice may be done to the first inventor, if he desires to have a patent. The chance that there should be at the same time two independent inventions exactly the same, is so small, that it can only happen very rarely, in the course of things; and cases of collision are usually the result of piracies more or less flagrant.

Is it not the practice for a person applying for a patent, to present his petition at the Secretary of State's Office?—Yes, that is the first process: the petition being accompanied by an affidavit, to give authenticity to the allegation.

Is not that petition referred from the Secretary of State's Office to the Attorney-General?—The agent must fetch it from the Secretary of State's Office, after it has received an indorsement on the back, containing a reference to the Attorney-General, or else to the Solicitor-General.

What is the object of that reference?—It is to have the Attorney or Solicitor-General's opinion, on the propriety of granting such a patent as the inventor requests.

Does not that reference assume that some discretion is exercised by the Attorney-General in regard to granting patents?—Unquestionably: I suppose that form of reference is not peculiar to patents, but it is very likely that other applications to government for grants from the Crown, are referred in the same form to the law officers, or other servants of the Crown, who may be best qualified to give sound advice upon the subject.

What is the nature of the affidavit accompanying the application to the Secretary of State?—The affidavit is, that he is the real inventor of that, for which he applies for a patent, and that, to the best of his knowledge and belief, it has not been used by others, and will be publicly beneficial.

In point of fact, the discretion of the Attorney-General is not exercised upon the subject?—There is a discussion of some sort exercised, for instance, when a patent is applied for, during a time of war, for any invention which might have a material influence upon the public service, an inquiry is made, as to how far it would affect the King's service; and in many patents for inventions relative to military or naval affairs, there is a clause in the patent, that the patentee shall be bound to furnish all that may be required for the public service, at such reasonable prices as shall be settled, I think, by the boards in each service, such as the Navy Board or the Ordnance Board. In those points which might affect the interests of the King's service, discretion was exercised.

When the patentee comes before the Attorney-General, he has to give a general description of the nature of the invention?

—In case of opposition, but not without; and it is a great evil that the applicant is no way fixed to what he does intend to specify. There have been some speculators or patent jobbers, who the instant that they find out that a person of talent is occupied with an invention, apply for a patent, with a title sufficiently general to cover the invention; and having thus got the start of the inventor, if they can by any means get at the invention before the time of specifying, they have a good chance of making it their own; for even if the real inventor gets notice, and makes opposition, he is the second applicant, and is almost always obliged to make it a joint property, because unless he can prove the fact of the plagiarism, the Attorney-General can rarely be convinced of the identity of the same invention, when differently explained by two parties, with different models or drawings, and when one party has an interest in disguising the similarity; or that party may purposely describe quite a different invention to the Attorney-General, who keeps no record what it is, that the applicant applies for, or describes verbally, in case of opposition, further than as it is expressed by the title of the patent; hence, after having either from ignorance of the real invention, or from design, made a fictitious explanation to the Attorney-General, he may get the real invention by treachery, and put it into his specification. A patent was granted on the 29th November last (but is not yet specified), it is intituled, "For certain Improvements in the construction of Steam Engines, and the Apparatus connected therewith;" the patent gives eighteen months to prepare the specification; now whatever that patentee can find out, by any means, in the course of eighteen months, (or perhaps during two years, dating from the time of his first application,) that will be covered by this comrpehensive title, he may bring it forward in the specification, and nobody can prove that he did not possess the invention, at the time of his application.

Is the principal point that the Attorney-General takes into consideration, whether the title of the patent applied for, agrees with the title of any other patent, concerning which a caveat is lodged?—His clerks do that, the Attorney-General himself cannot enter into such details; if the clerks think that the application for a patent corresponds with the title of any caveat lodged, they send a notice. In judging of that correspondence between the title and the caveats, they are very liable to be mistaken. If no steps are taken in a certain time in consequence of the notice, the patent is allowed to proceed; there are I believe, three days allowed to send answers to a notice sent to a person in town, and I think, five days in the country, during which time they keep the patent waiting for opposition to be made, if any person chooses; opposition may be made, by any person who applies in time, without a previous caveat, or notice to that person.

You recommend that the patent should be secured to the applicant from the time he makes his application?—Unquestionably; that is, I do not contend that the patent should be secured to the inventor at that time, against all objections that might be to the grant, but it should be secured against the effect of treacherous or rival publications of the same invention, before the sealing of the patent.

In case that improvement were adopted, would it not be necessary to make an alteration in the course of proceeding in other respects; for instance, would it not be necessary to make the applicant for a patent, lodge a specification at first?—Certainly, a kind of temporary specification of principles; that is the case in Spain; and in France and America, the complete specification is required in the first instance.

You mentioned the inconvenience that is felt by inventors, from persons whom you call patent jobbers, what remedy would you propose for that?—To fix every applicant, as is done in France and America, by some specification in the first instance; only that I would not recommend a complete specification to be then required, but a temporary one, containing a definition of the principle and object of the invention, leaving the patentee afterwards to prepare a more complete specification when he had organized, and proved, the means by which the invention is to be carried into effect; that final specification should be examined, and ought only to include such matters as are, in the opinion of competent examiners, a fair extension of the statement of his original idea, as expressed in the first deposit. As it is now, the patentee is not obliged in any way to declare what his invention is, till he puts in his specification to the patent previously granted to him, and in the mean time he may change his plan within all the latitude that the generality of the title will permit.

Would you advise that a person applying for a patent should have his specification ready at the time of his first application?—Not his complete specification; that is done in other countries but would be impracticable here, because the spirit of rivalry and competition is so strong, that an invention cannot be put to the test of experiment, or brought to bear in secrecy, so as to enable an inventor to defer his application until he is prepared to specify properly; that may be done in foreign countries, where secrecy can be more readily preserved, but not here. The specification, with all the details of description necessary for instructing the public how to practise the invention, cannot be made, till the invention has been actually practised; I recommend that the inventor should lodge a statement of the particulars necessary to define the principle, and explain the outline of his invention: for instance, if it is an improvement in the steam engine, he should state the part of the engine to which the improvement is to be added or applied, the *modus operandi*, and the effect it is to produce; so that when the complete or real specification is afterwards made out, it can be decided by competent judges, whether it is a fair developement of the ideas originally recorded in the provisional definition.

Is not great inconvenience experienced from the circumstance, that after the application and before the enrolment of the specification, the applicant is precluded from proceeding with his invention?—There is; and also from the difficulty of making such a title as will, in the opinion of judges, correspond with his specification; he is subject to the danger of losing his patent afterwards.

Would it remove that inconvenience to secure the patent for the invention, to the applicant, without a distinct specification at the time of the application?—It should be a provisional, or outline specification, with security that during the time allowed for preparing the complete specification and granting his patent, he should be protected against the effect of any publication of his invention, but not against infringements of it. No infringement of any importance could arise in three or four months, in a new thing; the great danger is now, not of people infringing his patent, but of their publishing the invention, and thus destroying his right to the patent; and perhaps the publication may not be made, until after he has paid three fourths of the fees for a patent thus rendered abortive.

You would compel him on applying for his patent, to lodge a statement of the principles to be afterwards developed in the specification, and you would require that when the time has arrived for the inrolment of the specification, and consequently granting the patent, he should give the details, to be transcribed into the patent itself?—Yes, the knowledge of those details does not always exist at the time most proper for applying for the patent, and therefore it is impossible that they should be described, nor will they come into existence, until the thing has been put into practice; as it is now, the two months which elapse between the time of applying for the patent, and the time when the patent is granted, are lost, as to any such creation of the means of putting the invention into practice, and therefore the patentee has in fact only the remaining two, four or six months, and in that time he must prepare his specification as best he can.

Would there not be a difficulty in securing to any one, a property in what was not distinctly defined?—For a permanency it would be an excessive difficulty, but for the short term of two or three months, it would not be any inconvenience to give a right, that is completely defined, and in some degree described, by the outline of a specification: in Spain the practice exists. In fact, every patent now granted, is in force for two, four, six and some for eighteen months, before there is any definition whatever, of the right it confers; but that is an evil, as I have shown.

You mean that he should be not only authorized, but compelled, in the first instance, to give a specification something more precise than is frequently now given?—Certainly. In the Spanish law it is optional; but I think it should be an essential condition for the first step; no record at all, is now given in the first instance, nor is any writing usually preserved, in case it is explained to the Attorney-General, upon hearing of opposition.

And you would require this greater precision in the meaning of the first application, not for the benefit of the applicant, but for the benefit of other inventors that are occupied at the same time, on the same subject; it is an intolerable nuisance to persons who are engaged in speculations, that they are perpetually in danger of having their inventions or improvements stolen from them, and put into the specifications of some existing patents, not yet specified, but which have titles that will cover their inventions. Such undefined patents are like legalized receiving houses for stolen goods.

Are the inventors whose ideas have been so appropriated by previous patentees, called upon to prove the negative that the patentee did not invent what he specifies?—Yes; they must prove that the invention was in use before the date of the patent; or that it was communicated surreptitiously from them to the patentee after the date of the patent; their proving that they invented it or put into use themselves after the date of the patent is not sufficient, because the invention became the property of the inventor from the date of the patent, although he is not called upon to declare what it was for a long time after.

Is there any limiting law to the time which is allowed for the specification after the issue of the patent?—None by law; by custom it is two months for each patent; thus upon a patent for England two months is allowed, for England and Scotland four months, and for England, Scotland and Ireland, six months; of late years, on declaring in the first instance that they mean to proceed with patents for England, Ireland and Scotland, they obtain six months at once in the English patent. I believe they must take some of the first steps towards applying for those Scotch and Irish patents, and must incur some expense in consequence, but they are no way bound afterwards to proceed with the Scotch and Irish patents to completion, It is quite discretionary in the Crown how long time should be allowed, and on special showing (I believe, to the Attorney-General) longer terms are occasionally granted. The patent I have mentioned for improvements in steam engines is eighteen months; there were several eighteeen months patents granted ten and fifteen years ago, and great complaints were made of the evil. I was employed in 1816 by parties who had just got a fifteen months patent sealed for themselves, but not specified, to draw up arguments and instruct counsel to complain of another such patent then in progress being granted, with the same time, to their rivals in trade, and to oppose that second patent being sealed by the Lord Chancellor, on the public grounds, I have before stated. Although the Attorney-General had made out and passed it, as far as he was concerned, Lord Eldon refused to seal the patent as being very improper, and intimated that no more such patents should be sealed, and there have been none till this recent instance. I do not mean to say that this patent is any intentional unfairness, for it is granted to Colonel D'Arcy, the executor of the real inventor, who is dead, and hence I suppose he showed to the Attorney-General that there was some necessity for the unusual time, to get the papers of the deceased together, or to examine his manuscripts; but the principle of granting an undefined legal right to be in force for a year and a half, without definition, needs no comment. The old pretence for such long time was to get time to apply to Parliament to have the specification kept secret, in order that the invention might not get to foreign countries.

Do you see any inconvenience in allowing a long time for the specification?—It is essential to getting sufficient specifications made of important inventions, to allow a long time; and on the other hand, it is an excessive grievance to persons engaged in like pursuits, unless some provisionary definition of the legal right, that is conferred by the patent, were to be made public.

Would not the grant of a long time for the specification, enable a fraudulent party to avail himself, for a limited period, of the patent without revealing it to the public?—It might; but even eighteen months would commonly be of no value at the commencement of a new invention of any importance; because it is so difficult to begin at first and only occasions expense instead of profit.

Are there not many inventions that are only valuable for a short time?—Very rarely; they must be very evanescent inventions; such as the kaleidescope, and the hobbyhorse called velocipede, which must necessarily be of no value to the community; I consider that such patents are of no public utility.

Are patterns ever the subject of patents?—No; but it is not well defined, nor is it easy to define, what degree of invention shall or shall not be the subject of patents; it is very desirable that patterns should be protected in some ready way, but not by patent; it would be too expensive and tedious.

Arthur Howe Holdsworth, Esq. a Member of the Committee; Examined.

Are you prepared to furnish the Committe with any suggestions upon the subject of the Patent Laws?—I will furnish them with such information as has come to my knowledge from facts that have occurred to myself, not assuming any thing of a legal opinion; leaving to the Committee to form their own judgment, as I shall do myself, upon the things that have occurred. To make this subject as clear as I can, I would first state that there are patents of various sorts; I would divide them first into two, one for a process for articles of which the patentee is himself the maker; another for a process which it is intended shall be used by others, to whom he would grant licences for that purpose. For instance, I may be in a particular trade, and take out a patent applicable to that trade; or I may not be a tradesman, and then I should take out my patent for the purpose of licensing tradesmen. I mention this only to show, that to comprehend the use of the patent law, we must have a view to both these cases, otherwise we shall not be likely to come to the necessary conclusions. These patents also are divided into different subjects, mechanical, chemical, and chemical and mechanical united. It has been stated that patents may be multiplied to too great an extent; I conceive that idea arises from this circumstance only, that as the law is not clear with regard to patents, so many are obtained that appear defective in law which by confusing workmen really do mischief; but if the law be made so clear and defined that a patent for a something really useful, when taken out, would be found to be secure, then I cannot conceive that we can have too many patents, as they are the reward of men's ingenuity. One man has a property in the funds, another in land, a third man in the powers of his head, evidenced by his inventions; and I conceive that if you were to attempt to limit the number, you would at once cramp men's ingenuity, and not give those who are clever their fair value in the market, because their brains are the only property which they possess. I will first state the difficulties which appear to arise on the taking out of a patent. There is nothing more common, than that two persons of similar habits and pursuits should be thinking of the same thing at the same time, and it at once becomes a race between them, as the law at present stands; at the moment that one is known to be soliciting a patent, the other man uses every means in his power to discover what the other person is about, that the first may not clash with his; and if he is a dishonest man, and finds that his own is not good, that he may so oppose the other as to render that of the first person useless, unless he will agree to alallow him to become a participator with him by making it a joint patent. But that is not the only difficulty in which he is put at present; there is that of intituling his patent in such a way as that other persons, not then thinking of a patent, may not be by it induced to do so; or that others, who know the value of a patent for such a subject, may not set their brains at work to endeavour to obtain one also. That circumstance happens to be within my own knowledge at this moment; there is a great want of a certain something at this moment in a particular kind of business, a friend of mine has discovered the thing required, and I am quite satisfied, from knowing exactly what he is about, for he first set about it at my request, that he could go for a patent, and that the patent would be very valuable. I also know another person, with whom I am well acquainted, who being in the trade, is aware of that necessity as much as myself, and I feel satisfied that if my first friend were to go for his patent, the second without meaning at all to do the first an injury, would be immediately set at work, and would at once know, from his knowledge of the subject, what the other man must be about, and they would come in collision; and therefore the only probable remedy at this moment would be to bring the two parties amicably together. I would exemplify this also by another circumstance of the same sort, where a person was absolutely soliciting a patent; a friend of that person informed me of it where a party was assembled in this city. I was surprized at what he stated, because it appeared to me almost next to impossible that the end stated to be sought for could be obtained. I told the party that I would endeavour to find it out, and that if I did, I would come to them and inform them of what I had done; and I came back on the day I had promised, and told the party that I had accomplished my object. The person who first mentioned it to me, asked if I had any objection to allow a third person to be the umpire between us; on condition, that if our ideas were the same, we might unite our forces, but that if our ideas were different, each might still proceed. I agreed, but I did not meet the other man, but the third person who was to be the umpire only; and when we had both stated to him our ideas, they were so perfectly unlike, though attaining the same object, that we both took out patents. That patent I have never used, but it is at this moment in existence; they were patents for making gas-holders capable of containing a double quantity, when compared with their usual contents. In further illustration of what I have said respecting different men pursuing the same object, another patent came within my own knowledge, where a friend of mine and myself were concerned. We believed a great object was to be gained by a peculiar process in a trade of great moment, and I took a great deal of pains whilst I was travelling in different parts of England, to ascertain whether it would be so or not, and whether such was known. We did not conceive that any person had ever thought of the same thing. Nothing had ever transpired publicly as to such belief, but when I returned to London, a friend told me that he thought a person had been taking out a patent very similar to it, and referred me to the brother of the patentee, who referred me at once to the specification, and I found that we had both been travelling exactly to the same point and by the same road; and although the process has not as yet been used, I am quite sure it will be found a very valuable discovery. This, then, will assist in accounting for the cause of our having heard so much of persons giving titles to their patents which do not at first sight appear to convey the real meaning of that for which they ultimately specify. It is not for the purpose of improper deception, but it is because the law so stands at present, that if they do not so guard themselves they are liable to be imposed upon, and to have all the benefit of that invention which has been the fruit of a vast number of years consideration, in one moment swept away from them.

Can you suggest any remedy for these inconveniences?—I should conceive, from all the difficulties that have occurred to myself, and to the friends I have been acquainted with, that the best remedy would be what has been recommended by other witnesses, namely, that the inventor should be secured, under such conditions as shall hereafter be thought right, from the time he makes his first affidavit, so that other parties may not have the opportunity of availing themselves of his first discovery of his invention to the public. This opens another circumstance worthy of the consideration of the Committee before they make their Report on the Specification, because it to a certain degree alters the state in which a person is placed; I conceive that if the patentee could be secured from the time of his petition, he might, as regards his monopoly, be allowed any time he pleased to specify, provided his patent bears date from the sealing, that is, as between him and the public, as he would still have only his fourteen years, and these running from the period when his patent is sealed. If he required a longer time to specify, from any thing particular, the public would be no losers by that, inasmuch as the specification is a part that is of no importance to any body but himself, if the law really secures his invention to him till his fourteen years has expired. As the length of the time occupied by him in his experiments is a loss to himself only of that portion of the monopoly, and it is therefore not a question as between him and the public on that head, that can in the slightest degree affect the public; the only way it can effect them, is in preventing others from proceeding with other patents, fearing that they may run upon the road which he has already taken; therefore a limit on that account would be required, and the question would ultimately be, to what time that limit should, under such circumstances, be confined. The next point to which I would go, is the difficulty under which patentees appear to me to labour after patents are obtained. The first which strikes me is the case in which valuable patents may be defeated through the ignorance (I mean mechanical and chemical ignorance) of both Judges and juries, who with the very best intentions in the world to do justice as between the parties, yet not being fully aware of the value of the minutiæ of those peculiar subjects, will get the contending parties into greater difficulties than those in which they originally started; and this is greatly felt at present from that spirit of attack which is now so constantly exercised against the patentees, urged on by this particular fact, that the public, or the parties attacking the patentee, have every thing to gain and nothing to lose by it, whilst the unhappy patentee has every thing to lose, and by no possibility any thing whatever to gain by it. It is a circumstance well known to those who have been in the habit of taking out patents, or have given their minds to mechanical subjects, that whenever a patent for a valuable invention is taken out, there are persons who immediately try by every means in their power to gain all the advantages to which the patentee is entitled, by studying how he may avoid in some way or other the specification, for by getting through that instrument a perfect knowledge of the process, he becomes perfectly acquainted with the views of the original inventor, and then endeavours, through some other mode as not yet practised, to avoid the specification, giving to his mind a view of the subject which he never would have thought of, if the original inventor had not yet first obtained the monopoly which, on specifying, the patent gives him; and it is not at all considered, I am sorry to say, by many persons in the slightest degree dishonest to do every thing in their power to defeat a patentee, after he has obtained his grant. This has occurred to myself in a most extraordinary way, and not confined at all to mehanical persons, but extending to others in no degree connected either with science or mechanics, but who seem to have taken up the same idea, viz. "that a patent is fair plunder." I would instance one set of persons, who first of all agreed to take a licence for the use of the patent process, and after having so done, whereby we conceived that they had acknowledged our right in it, they set us at arms length, and used it; drove us into Chancery to open their door to see what they were doing; that is, to obtain legal proof of it, and then into court after we had obtained that proof; and the night before we were to come to trial, compromised and took a licence from us. Another party after this, conspired with three or four other set of men, dared us to the proof, and denied that they were using it. We were then obliged to go again to Chancery; but they consented to allow us to inspect. Upon inspection by a third person, we found they were using our process; they continued to use it, and defied us: we had then no remedy but to charge them with this in Chancery, and to oblige them to come in and answer for themselves; one of these companies denied that it was a patent or that they knew it was a patent, although the company was established on this basis; and they would not have obtained the power of becoming a company at the time they did so, if the patentee had not discovered his process; he came to London for them, and was ready to attend a Committee of the House, and to give proof of his invention; but they allowed a clause to go into the Blill, which compelled them to adopt this or a similar description of process, and they had paid him for the trouble he had taken, and for his journey to town upon it. In company with those, were two other large and powerful companies, from one of which a deputation had waited on the patentee long anterior to the time when we discovered they were using it; they had acknowledged the value of the process; we had a letter in our briefs from themselves, requesting to know the terms upon which we would license them. We visited their own place, we saw they never had used it, and they abstained from using it at that time, because they could not come to terms with us; they let a short period go over, and then used it privately; denied that they were doing it, and ultimately joined the other party in opposing us. They were at last, however, obliged to appear in Chancery by Affidavit; and then the whole of these conspiring parties attempted to bolster their case, by bringing persons to swear by affidavit that the thing had been used before any of those negociations or communications had taken place. It fortunately, however, happened for us, that we had anticipated the principal evidence, and expecting where he might state he had used it, as having been employed there anterior to our patent, we applied to the party who had employed him, and we had an affidavit from that person stating that there never had been any process similar to ours used in his house; so that when the affidavit of this man was produced, it was at once refuted; because, fortunately for us, he stated that he had used it at the very house with respect to which the owner (a most respectable person, and perfectly free from any connection with any of the parties) had already given us the directly opposite proof; it also fortunately happened that this man had published a book, in which he stated all the inventions that he had made; and it bore date subsequently to the patent of my friend, and when his process was well known; and although this witness swore that he had so used it, when we searched his book we found he did not say a word about it; though he begins by stating that he would give an account of all his inventions. This case was of so much consequence, that we employed four counsel in Chancery; we had consultations, and every thing that could be necessary for a case of the greatest importance. We appeared in court for a decision upon whether or not an injunction should be confirmed restraining those parties; a compromise was proposed; we consulted our counsel, and although we knew that they had the strongest case upon affidavit that they ever saw, and where this peculiarity attached, that if those who had sworn on our side had said a single word wrong, there were, I will venture to state, hundreds of persons who could have denied us, and yet not *one* did; still so uncertain did the counsel consider the view that the court might take of the case, that they advised it, as the more prudent course on our part, even then to come to a compromise, on their all taking licences; and under their advice we did so with all the parties, who had thus conspired against us: but this did not rescue us from attacks; for at this time five or six other companies are again conspired together to endeavour to defeat us, although we have granted licences to at least fifty different sets of people, and the patent has but two years to run; so that I would venture to make this remark, that, situated as the law is at present, and with such a state of society as I have described, patents may be rendered next to useless, (however good they may be,) by the constant attacks that can be made upon the patentee, supported as these attacks now can be by such evidence as it is in the power of almost any man occasionally to obtain.

Can you suggest any remedy for the evil you have described?—It appears to me, that the best remedy that the law of the country, as far as I understand the law, would at present offer, would be this, that after a person has publicly used his patent for any given number of years, (say five if you please,) and no one has thought it worth his while to bring a *scire facias* against him, on the score of its not being a novelty, or having been used before, and therefore not a fit subject for a patent, whilst he has himself attacked (thereby showing his disposition) those who have endeavoured to pirate his invention, although compromises may have taken place between him and other parties, the patent should be deemed good and valid, and that an injunction should issue against all future aggressors, which should not be dissolved, the same as if his patent had been proved valid in court. I conceive that the King having granted a patent, the law should originally presume that that patent is a good one, and that the onus should be on others who believe it bad, to repeal it by *scire facias*, within a given time; it should not rest on the patentee to be eternally driven to bring action after action, and to be harrassed to the very end of his patent. My reason for stating this is, that if you consult upon such a subject, you will be told, as we were very properly told, you may safely compromise, as it will be clear to the world, that if the parties against whom you bring your action compromise with you and take a licence, that the other party found themselves in error; so we fancied, but the truth was not so; others attacked us in the same manner, and then when we had to consult counsel upon our second case; they said, although in the former case you could not try for an *ex-parte* in-injunction, we think now, after having first gone into Chancery, and then into court, and the parties compromised with you, taking your licence, that will be sufficient proof after so many years of use, that we have very little doubt that the court will, upon your showing that all those things have taken place, and that you have, during eight years, used all due diligence to bring those you could detect to account, but that the court will confirm an *ex-parte* injunction; but the result really was, that they themselves deemed it afterwards prudent in court to advise us again to compromise upon the parties all taking our licence to use; and again we were left in the tenth year in the same situation that we were in the very first day we started; I conceive therefore, that if after any given time in which persons have allowed the patentee to work upon his specification, and have not within that given time thought it worth their attention to show that his patent was not originally good by moving a *scire facias* against him, that after that period the patent should stand good, provided you could prove that you had used all due diligence to prevent every one from working upon your process, with whose conduct you could be proved to be acquainted. It was proposed to the Committee, to preserve the patentee against the description of evidence which I have mentioned, not to permit any evidence to be given of its having been used before a certain time anterior to the sealing of the patent, and that parties should not have the power of going back to any indefinite period they please, when it would, from length of time, be impossible to get evidence to rebut it; leaving the proof of prior use, as at present, on the word of one man; by which any patent can be so defeated; because it was stated, and with much justice, as my experience teaches me, that nothing is more common than to find persons who will come into court and swear that they have so used a certain process, and such swearing will defeat a patent, although no collateral circumstance is adduced that can confirm it, the court feeling itself bound to rely upon the bare oath of a solitary individual. With regard to another proposition which was made, and which I have considered, as to the circumstance to which I am now referring, namely whether a proof of prior use should be allowed beyond a certain number of years, anterior to the sealing of a patent; that seems to have been the policy of the French law, as evidenced by a very strong fact, namely, that a patent taken out and neglected to be used only for two years, shall so perfectly destroy it, in consequence of the neglect of the first person, that another person may take it out again, and it shall be good against all the world. In proof of this, I can state that a friend of mine, with whom I was interested, took out a patent in France; it was necessary, under this law, to use it within two years; this he had no means or even view of doing himself, but to license the use to persons resident in France, a treaty was entered into with a man there; circumstances, which he could not control, prevented him from coming to an immediate conclusion; the parties with whom he was treating kept putting him off from time to time, after his having placed one of his machines in the hands of a banker, who was also a gold and silver wire-drawer; the patent was for drawing wire through holes made of *jewels*. The treaty was continued till the two years were run out; he then went over, when he was told the treaty was at an end, that he had never used it, and that his patent was forfeited. Upon closer investigation, he found that the moment he had placed the jewelled hole in the hands of the banker, he had sent it to Geneva, where an ingenious workman, who had been in the habit of perforating holes in jewels for watches, was employed to make a set, which they had found completely answered the purpose; and he learned, to his annoyance, although he had been offered 10,000*l.* for it, this banker had then, by this stratagem, availed himself of the law of forfeiture, by keeping it out of use; that he had taken out a patent for five years, had given the holes to his workmen at Lyons, and having established the use, had so reduced the labour, that he obliged the workmen to labour at two thirds of their former prices, thus reaping the reward of his infamy, the extent of which is inconceivable, where they draw wire for almost the whole of the continent for making gold and silver lace. I conceive however, that so far as regards the period of two years, the facts I have stated have shown the badness of the law; because if a patent was to be forfeited in this country for nonuser at two years from its date, that is from the sealing, no person would like to take out a patent that he did not himself work, because a third person taking out a patent for the most ingenious thing in the world, could be defeated, by the people in the trade refusing to work upon it until the expiration of the two years, when the thing would of necessity become public; but I conceive if it were lengthened to five years, that would very much alter the case. I merely throw this out by way of showing how the thing is done elswhere, and what might be its operation.

What is your opinion with respect to allowing patents to be taken out for a principle?—With regard to patents for a principle, from the evidence which has appeared before us, and from what I myself have previously understood upon matters of this sort, there is great difficulty, from different cases which have appeared to be ruled as for a principle, while I believe the law to be, that a principle cannot be patented unless it is reduced to practice. It was suggested by one of the witnesses that the law should be settled one way or the other, and he seemed to advise rather that principles should be allowed to be a ground for taking out a patent; but if it is to be ruled on one side or the other, I conceive that it would be wiser to say that the word "principle" never should appear at all in the case, and that the Judges should be bound by an absolute practical process, without at all inquiring upon what principle it is, but whether the thing done be a new and entire fact, and one worthy of a monopoly. As the word principle throws it into confusion on one side or the other, as I conceive such cannot be patented without an effect or process being produced upon the principle, it would do better to avoid the word principle altogether, and say that the fact or process specified shall be the thing that shall be secured. I will exemplify the patent with regard to shearing cloth. There it was held that no man afterwards should shear from list to list, because that was the *principle* of the original patent; but if another man can shear from list to list by a process perfectly distinct from any which the first man has described in his specification, I do not see why the second person's ingenuity is not to be equally rewarded; for if that man in specifying originally, conceived that it could be done by more than by the plans specified, he would have embraced them all; and at all events I feel, that taking the great bulk of patentees, you may put the patent law into a shape that would do more real good by excluding principle, than by admitting principle to be taken into consideration. One of the witnesses stated that Bolton and Watt's patent was for a principle; he was asked what that principle was, and he said he had not sufficient time to consider. I imagine that the ground upon which that patent was taken out, would rather be against the case of establishing a principle than otherwise. The only difference between Bolton and Watt's engine and those which had been used before, was this; that those engines that had been used before condensed in the cylinder, and consequently cooled the cylinder at every stroke. Bolton and Watt considered that a great saving both of time and of fuel would be gained, if they were not to condense in the cylinder and cool it at each stroke, because certain portions of steam were naturally lost in again getting up the proper heat of the cylinder; they therefore contrived a second vessel, called the condenser, communicating by a pipe with the cylinder, a jet of cold water being let into the condenser; so, being a separate vessel, the moment the steam is condensed in that, it creates a vacuum, so that the remainder of the steam continues to rush in and fill it up, till the whole becomes a vacuum, from the vessel in which the condensation takes place, to the most distant part in the cylinder, and does not tend to cool the cylinder as in the former instance. If there was a new principle, that principle only could be from the want of prior knowledge at that time, that if you made a vacuum in one vessel, and there was a hole communicating with another chamber, the steam would rush in to fill up that vacuum, which I conceive to be a principle perfectly known before, and that therefore the engine was not a new principle, but the new application of a known principle to a new purpose. It is supposed that Bolton and Watt's patented a principle, when they took out a patent for their steam engine; I believe they only patented a method of applying an old principle to a new engine.

Do you think that the specification should be allowed in any instances to be concealed?—I conceive there may be times when a concealed specification can be of value to the patentee, and at the same time not an injury to the public; and that when witnesses have been asked as to what would be the effect of a concealed specification, they have been led into a difficulty, and unable to give the Committee satisfaction upon it, because they have not considered what would be the state of a patent under such new circumstance. Men speak frequently of the uselessness of a concealed specification, because they could not defend their patent without bringing it into court, and that, therefore, their own objects would be defeated by the first man who pirates them. And it is also asked, Would it not be the means of permitting other persons to work innocently upon the same plan which they have already patented, and thus bring those persons into difficulties with the patentee, when he should discover the process they were using? There is no doubt, and that the latter would at first sight appear to be the fact. But it would be a matter of policy, and worthy the consideration of the patentee, whether or not he would attack such party, and thereby open his specification; and whether he would not rather let such man continue to work, provided that man took due diligence to keep his mode concealed from the public: and the reason why I mention this is, that I know there are persons that have made valuable discoveries, and are now working secretly upon them, preferring to trust to concealment rather than have a specification which will enable other persons, anxious to run on the same road, to discover the process by which they themselves are working. I do not feel that any other person would be put to any hazard, provided the same justice was given to both parties as is already attempted to be given with regard to all other alterations of the law; because, supposing a patentee had this advantage given to him, a condition should be imposed upon him, that any man who worked upon the same process during the time he kept his specification concealed, should be allowed to continue that work till the end of that patent, free of any charge from the original patentee; and that the patentee should have an action at law only against such persons (as is at present the case) who should use his process after he had made his specification known. I state this in consequence of believing, that it would be in many instances much more valuable to a manufacturer to allow even a second and a third man to work, provided they put their heads together and concealed the process from the public at large, than to throw it open, and to leave the whole world to pirate and destroy him, as is at present the case. This could only be of value on certain descriptions of patents, to which I have originally referred, namely, those which are used by the manufacturer himself, and not those of which profit alone is to be made by licensing them to third persons. I would under no circumstances therefore say, that all specifications should be concealed from the public; but I cannot but believe, that it would be advantageous in many instances if a man could have the power of getting it concealed during such period as he might think to his own advantage to keep it so.

Have you ever known that patents have been licensed to some individuals, and that the patentees having fixed upon the terms upon which licences might be fairly granted, have refused to grant them to other parties?—It has never come within my own knowledge.

Have you ever known cases in which any sort of arrangement has been made between the patentee and the party to whom it has been let, that it should not be let to other people?—It has been proposed to me, but I have never acceded to it. I have heard it questioned by a lawyer, whether it would not be contrary to law.

In the observations you have made, with reference to keeping a specification concealed, you have not adverted to one inconvenience which it has been stated would arise to the public from not knowing what the patent is granted for, so precisely that persons might not engage in discovering inventions which have already been patented?—I think that inconvenience could not happen, because I have already stated that no man running the same course should be liable to any action for so working, so long as the patentee thought it fit to keep his specification concealed.

Are there not cases in which a patent could not be adequately protected without allowing it to be taken out for a principle? take, for example, the case mentioned by Mr. Rotch in his evidence, of a wash being exposed as a shower to the action of heat?—I presume that any man who has ingenuity enough to invent what is considered a new principle, could only do it through his knowledge of the wants of different manufacturers of an improved process in their business, which process he has applied his mind to accomplish; and that the same mind that would see it fitting in one way, would, before he specified, take the whole range of mechanical means by which that could be accomplished, and that he would be fairly entitled to specify for all those means, and that these would hold good for all the different manufactures to which they could be applied; that he would have a fair right to specify for all such manufactures; and as to those which did not then exist, or of which he had at the moment no knowledge, that to those he would not be entitled to any right, for he would have given nothing to the public as an inducement.

You conceive that a person who has made an invention could foresee all the means by which that invention could be used?—I do conceive so; that is, all the means that are usually known in mechanics, and are in practice.

You have said that patents are sometimes infringed by introducing some slight alteration in an invention, so as to avoid trenching upon the specification?—Yes; but by alteration I mean another road, suggested by knowing the first: a slight alteration would not give the second man a patent, but it might suggest to the second man another road, which at once defeats the value of that which has taken the first man years to accomplish.

You have stated that the presumption should be in favour of the patentee; do you think that presumption should be raised, while the present loose mode of granting patents continues?—

I should say always in favour of the patentee; because it is the only reward for his ingenuity, and he is one man against all the world.

You are aware that a patent is granted now without any examination on the part of the Attorney-General, unless it is opposed?—Truly; but the best security you can get in this day that a patent will not be taken out, unless the party thinks it is good for something, is the expense; I do not presume that that description of man who is in the habit of taking out a patent would go to that expense, unless he had, he believed a profitable end to gain by it.

New Patents Sealed, 1830.

To John M^c^ Innes, of Auchenreoch, and of Woodburn, in that part of our United Kingdom of Great Britain and Ireland called Scotland, Esq. for his having invented the manufacture or preparation of certain substances, which he denominates the British tapioca, and the cakes and flour to be made from the same.—Sealed 24th April, 6 months.

To Samuel Brown, of Billiliter Square, in the city of London, commander in our Royal Navy, for his having invented certain improvements in making or manufacturing bolts and chains.—24th April, 6 months.

To Joseph Cochaux, of Fenchurch Street, in the city of London, merchant, in consequence of a communication made to him by a certain foreigner residing abroad, for an invention of an apparatus, calculated to prevent or render less frequent the explosion of boilers in generating steam.—24th April, 6 months.

To Paul Descroizilles, of Fenchurch Street, in the city of London, chemist, for his having invented certain improvements in apparatus for economizing fuel in heating water and air, applicable to various purposes.—24th April, 6 months.

To Thomas Cook, of Blackheath Road, in the county of Kent, lieutenant in our Royal Navy, for his having invented certain improvements in the construction and fitting up of boats of various descriptions.—24th April, 2 months.

To James Perry, of Red Lion Square, Holborn, in the county of Middlesex, bookseller and stationer, for his having invented an improvement or improvements in or on pens.—24th April, 6 months.

To John Wilks, of Blue Anchor Road, Bermondsey, in the county of Surrey, engineer, millwright and machinist, (one of the co-partners in the firm of Bryan, Donkin, and Company of the same place, engineers, millwrights, and machinists), for his having found out and invented an improvement or improvements in a part or parts of the apparatus for making paper by machinery.—28th April, 6 mo.

To Thomas Petherick, of Penfullick, in the parish of Tywardreath, in the county of Cornwall, mine agent, for his having invented certain machinery for separating copper, lead, and other ores, from earthly and other substances, with which they are or may be mixed, and which is more particularly intended to supersede what is comonly called jigging.—28th April, 6 months.

To John Walker, of Weymouth Street, in the county of Middlesex, Esq. for his having invented or found out an improved cock for fluids.—4th May, 2 months.

To Henry Robert Salmon Devenoge, of Little Stanhope Street, May Fair, in the county of Middlesex, gentleman, in consequence of a communication from a foreigner residing abroad, for certain improvements of machinery for making bricks.—8th May, 2 months.

CELESTIAL PHENOMENA, FOR JUNE, 1830.

D.	H.	M.	S.	
1	0	0	0	⊙ before the Clock 2 *m* 36 Sec.
1	3	0	0	☽ in conj. with ϑ in Virgo.
2	13	0	0	☽ in conj. with ν in Virgo.
3	0	0	0	☿ Stationary.
4	6	0	0	☽ in conj. with γ in Libra.
5	0	0	0	⊙ before the Clock 1 *m* 58 Sec.
5	9	0	0	☽ in conj. with φ in Oph.
6	2	19	0	Ecliptic opposition or ○ full moon.
8	12	0	0	☾ in conj. with d in Sagett.
10	0	0	0	⊙ before the Clock 1 *m* 4 Sec.
12	13	0	0	☾ in conj. with λ in Aquarius.
12	22	0	0	☾ in conj. with φ in Aquarius.
13	10	49	0	☾ in ▭ or last quarter.
15	0	0	0	⊙ before the Clock 3 Sec.
18	9	0	0	☾ in conj. with γ in Taurus.
18	11	0	0	☾ in conj. with 1 ϑ in Taurus
18	11	0	0	☾ in conj. with 2 ϑ in Taurus
18	16	0	0	☾ in conj. with *a* in Taurus.
19	15	0	0	☾ in conj. with ♀ long. 20° in Taurus. ☾ lat. 4° 38' S. ♀ lat. 4° 15' S. diff. of lat. 23.'
20	0	0	0	Clock before the ⊙ 10 Sec.
20	3	3	0	Ecliptic conjunction or ● new moon.
21	11	50	0	⊙ enters Cancer..
23	20	0	0	☽ in conj. with ξ in Leo.
25	0	0	0	Clock before the ⊙ 2 *m* 7 Sec.
25	1	0	0	☽ in conj. with ϱ in Leo.
26	5	0	0	☽ in conj. with τ in Leo.
26	17	0	0	☽ in conj. with β in Virgo.
27	0	0	0	☿ Stationary.
27	8	0	0	☽ in conj. with ν in Virgo.
27	15	16	0	☽ in ▭ first quarter.
27	20	0	0	☽ in conj. with 1 γ in Virgo.
28	11	0	0	☽ in conj. with ϑ in Virgo.
27	20	0	0	☽ in conj. with η in Virgo.
30	0	0	0	Clock before the ⊙ 3 *m* 9 Sec.

The waxing moon ☽.—the waning moon ☾

Rotherhithe. J LEWTHWAITE.

METEOROLOGICAL JOURNAL, FOR APRIL AND MAY, 1830.

1830.	Therm		Barometer.		Rain in inches.
	Hig.	Low	High.	Low.	
APRIL					
26	63	43	30,14	30,12	
27	65	30	30,14	Stat.	
28	69	33	30,09	30,04	
29	72	39	29,96	Stat.	
30	73	39	29,85	29,82	
MAY					
1	63	34	29,83	29,81	
2	66	36	30,06	30,02	
3	64	30	30,13	30,11	
4	66	32	30,12	30,10	
5	72	34	30,04	30,01	
6	80	49	29,91	29,74	
7	77	49	29,64	29,54	
8	63	40	29,49	29,48	
9	51	45	29,34	Stat.	,125
10	52	41	29,60	29,37	,375
11	50	37	29,72	29,64	,1
12	55	38	29,81	29,72	,125
13	54	38	30,02	29,85	
14	59	31	30,10	Stat.	
15	67	40	30,15	30,11	
16	70	35	30,21	Stat.	
17	78	45	30,16	30,11	
18	76	47	30,01	29,89	
19	68	45	29,86	Stat.	
20	66	45	29,86	Stat.	
21	67	46	29,80	29,75	
22	63	45	29,86	29,69	,325
23	68	41	29,89	29,80	
24	67	51	29,69	29,66	,325
25	63	43	29,64	29,49	

EDMONTON. CHARLES H. ADAMS.

THE

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No. XXVIII.

[SECOND SERIES.]

Recent Patents.

To LEMUEL WELLMAN WRIGHT, *of Mansfield Street, Borough Road, in the county of Surrey, Engineer, for certain Improvements, in the construction of Cranes.*—[Sealed 17th August, 1827.]

THE principal subject of this Patent is a machine or engine, consisting of a novel and very ingenious combination of mechanical powers, adopted to the raising and lowering of heavy bodies. It is constructed without either toothed wheel or pinions, which form the essential parts of all other cranes, its power being derived from a peculiar adaptation of the lever and wedge. The following is the

SPECIFICATION.

"My improvements in the construction of cranes consist, first, in the application of the combined powers of the crank, lever, and wedge, acting on friction rollers, mounted on wheels, which wheels are attached to the drum or barrel, that the draft rope or chain winds upon: and, secondly, in the application of rotatory engines, alternating rotatory (vibrating) engines, or common, vertical or horizontal cylinder engines, to cranes of any description; the motive power to work such engines, and thereby to work the cranes, being the expansive force of compressed atmospheric air.

" Plate VII, figs. 1, & 2, exhibit the first part of my improvements. Fig. 1, represents a plan or horizontal view, and fig. 2, a side elevation of my improved crane adapted as a warehousing, or what is usually termed a housing crane. Fig. 3, is a longitudinal section taken vertically through the middle of a crane for the same purposes, but varied in its construction from the preceding. Fig. 4, represents my improvements as adapted to quay cranes, or landing cranes; the same letters referring to corresponding parts, in these several figures; *a, a, a, a,* are the two side standards or frames, connected to each other by horizontal bolts or stretchers, and upon which the working parts of the crane are mounted; *b,* is the axle of the drum or barrel *c,* round which the draft rope or chain *d,* is wound in the act of raising any heavy body; *e, e,* are two wheels or circular rims affixed to the axle of the drum *c,* and by bolts through their arms to the drum itself; these wheels carry a series of friction rollers *f, f, mounted* on pins, projecting alternately on each side *of the rims of the* wheels, which may be secured in their places by nuts on the ends of the pins; *g,* is a four throw crank shaft, which turns in the swinging frame *j*; to each of these cranks is attached one of the levers *h, h, h, h,* with wedge formed ends, and the fulcrums of these levers are bolts *i, i, i, i,* in the tops of the rocking crutches *k, k, k, k*; these crutches have their bearings on one of the bolts or stretchers, connecting the side standards. At one end of the crank shaft there is a fly wheel *l*, to regulate the motion of the parts.

" On the power being applied to the cranks *g*, by the winch handles *m*, or by any other means, the cranks as they revolve towards the drum wheels project forward; the levers *h, h, h, h*, and their wedge-formed ends successively pass under and raise the rollers *f*, and when past their centres revolving from the drum wheels, the cranks depress the longer arms of the levers, and raise the shorter arms with the rollers, and thus successively drive round the rims, and with them the drum or barrel.

" To throw the machine out of gear, the ends of the levers *h, h, h, h*, must be withdrawn from the friction rollers *f*; to do this, the pauls *n, n*, must be removed from supporting or wedging up the back of the swinging frame *j*, by lifting up the handle *o*, on the shaft *p*, when the frame with the crank shaft and levers may be drawn back against a rest *g*, seen in fig. 3.

" The crank and levers being thus out of gear, the barrel is at liberty to turn the reverse way, for the purpose of lowering the weight suspended, and the velocity of the descent is to be regulated by a two-part break, as shewn in figure 1.

" When it is required to put the machine into action, the counter balance weight *r*, hung over the pulley *s*, by a chain or rope from the swinging frame *j*, will assist to bring the swinging frame up into its working position, when the pauls *n*, will fall down.

" Where it is desirable to have the draft rope or chain suspended, so as to raise the weight directly under the barrels without any gin wheel, or jib head, the shorter ends of the levers may be made with the wedge or inclined planes the reverse way to those already described, when they will by acting on the upper side of the rollers force them downwards, and turn the barrel the reverse way to that already described.

"In fig. 3, the parts are the same as figs. 1, & 2, except that the levers *h, h, h, h,* work upon friction rollers *i,* turning on a cross stretcher, which friction rollers *i,* become the fulcrums of the levers *h, h, h, h,* instead of the rockng crutches before described.

"Fig. 4, is a side elevation, of the sort of cranes usually called a quay crane, with the several parts of my improvements, as applied in a vertical position; in this figure the break is shewn as acting on the outer edge of one of the wheels which carries the friction rollers, so as to keep the parts of the machine all within the frames.

"The frames in which this machinery may be mounted can be made of any form and size which the amount of power required in the crane, or any local causes may render advisable: and a crane may be made in this manner, by using two-throw, four-throw, six-throw, or eight-throw cranks, and correspondening wheels, with friction rollers on each side, to each pair of cranks and levers."

The specification proceeds to describe several modes of connecting these cranes with the working parts of engines of the same kind as ratatory and reciprocatory steam engines, which are to give out the mechanical power for working these cranes by means of compressed or condensed atmospheric air. One of these engines is called an *alternating rotatory* engine, which singular denomination is intended to express that the movements of the engine partake of both a rotatory and reciprocating action, that is, its piston is a vane turning within a cylindrical chamber upon an axle, and that it performs rather more than three-fourths of a rotation and then returns back again through the same arc, and so continues reciprocating in a circular course. The construction however of this, and the rotatory engine described, differ so little from rotatory steam engines, and particularly that invented by Mr. Wright and described in our twelfth volume (first series), page 57, and plate IV, that we do not consider it necessary to give a plate, or further explanation of the contrivance, and particularly so as the plan proposed of employing condensed air, as the actuating power, must be far from convenient, if at all practicable."—[*Inrolled in the Inrolment Office, February,* 1830.]

In our fourteenth volume we announced this invention, as one which *professed* to involve some new principle in mechanics, and having then witnessed its performance, were disposed to consider it as really a superior modification of mechanical powers, to those usually employed in the construction of cranes for raising and lowering heavy bodies. Much discussion took place upon the question by some of the scientific journals, our cotemporaries, who thought proper to ascribe to us expressions and opinions which we never uttered or conceived. Whether we were right in our views, appears still to be a question, on which we have only further to say, that the cranes put up by the Patentee at the West India Docks have from their commencement been worked by *four* men, while other constructions of cranes, exerting a similar power, are invariably worked by *six* men; and although the parties having the direction of them may differ in opinion, yet the fact stands uncontradicted.—EDITOR.

To **Francis Westby,** *of the town of Leicester, in the county of Leicester, Cutler, for his having invented certain improved Apparatus to be used for the purpose of Whetting or Sharpening the Edges of the Blades of Razors, Penknives, or other Cutting Instruments.* —[Sealed 26th Nov. 1829.]

The subject of this invention is a mode of mounting a hone or other oil-stone, designed for sharpening edge-tools; with certain appendages, as holders and guides: in order that a razor or other cutting instrument may be held and guided at a proper angle as it is passed over the oil-stone, and thereby obtain, with certainty, a correct cutting edge. The following is the

SPECIFICATION.

"My improved apparatus is intended to be used for whetting or sharpening the blades of razors, penknives, or other cutting instruments, which are usually whetted or sharpened by rubbing them upon the flat surface of stones called hones or oil-stones. By my apparatus the said blades are so guided that the cutting edge *must* apply to the surface of the stone at such an angle or inclination as is proper to whet or sharpen the said edge, and produce such a cutting edge as is required; and the apparatus insures that, when the blade is rubbed backwards and forwards upon the surface of the stone, it shall not deviate from that angle.

"Plate VIII, fig. 20, represents one form in which my improved apparatus may be constructed, shown in section, and fig. 21, is a horizontal plan of the same; *a, a,* is an oblong block of wood, in which the hone and the parts for guiding the cutting instrument are mounted. The wood is cut away at the middle part of the block, with a long deep notch to about two-thirds of its depth, and also a small cavity or chamber is cut in each end of the notch, shown by dotted lines in the plan, fig. 21.

"The notch or space excavated in the block receives the hone *b, b,* which is bedded with cement upon the bottom part; *c,* is a moveable plate of metal placed above the hone to apply to the back of the razor *d,* or other cutting instrument, in order to guide the blade and determine the angle at which its edge shall be applied upon the surface of the hone, when it is rubbed thereon in order to be sharpened. The guide plate *c,* is of the same breadth as the hone *b,* but rather longer, and the two ends of the plate, which extend over beyond the two ends of the hone, are supported by two upright screws *e, e,* which are fitted through holes in the bottom of the block of wood, their heads being countersunk within holes at the under surface of the bottom. The screws are passed through holes in each end of the guide plate *c,* and there are two coiled spiral springs of wire, embracing the screws acting between the underside of the guide plate and the bottom of the cavity.

"The elasticity of the springs tends to force the plate *c,* off from the surface of the hone, as far as the screws will permit; but, by turning the heads of the screws, the guide plate *c,* may be drawn down towards the hone, in opposition to the elasticity of the springs; or, by turning the heads of the screws the other way, the guide plate *c,* will be removed further from the surface of the hone; hence, by the screws *e, e,* the distance between the hone and the guide plate can be regulated at pleasure.

"The guide plate *c,* confines the back of the blade of the razor *d,* or other cutting instrument, from rising up too high above the surface of the hone, and thereby prevents the possibility of rolling the edge upon the surface of the hone when it is rubbed backwards and forwards, or forming the edge to a more blunt or obtuse angle than is intended to be given to it.

"The blade is inserted into the space left between the guide plate *c,* and the hone *b,* in the manner shown in the section, fig. 20, and the distance between the plate and the hone is adjusted by means of the regulating screws *e, e,* according to the thickness of the back of the razor, so that the back will nearly fill up the space left between the guide plate and the hone.

"The sharpening is performed by holding the handle between the fingers and thumb, with a sort of twisting action, which will tend to raise the back of the blade upwards against the under side of the guide plate, and at the same time press the cutting edge downwards upon the surface of the hone; the force of that pressure being determined by the said twisting action given to the handle of the blade, and tending as it were to turn the blade and handle round about its length as an axis.

"The blade being thus held with a suitable degree of twisting force and pressure of the edge upon the hone, may be moved backwards and forwards over the length of the hone, and at the same time endways of the blade, so as to produce that sort of horizontal circular motion, which is usually given to blades during the operation of whetting on an oil-stone; that is to say, every part of the blade is made to describe a horizontal circle or oval curve; but this kind of motion for whetting is no way peculiar to my apparatus, for it may be used with any other kind of rubbing motion which is suitable for whetting the edges of blades.

"In case the blades of razors or other cutting instruments are made with the back sufficiently thick to give the edge the proper angle when the back is made to bear upon the stone as well as the edge, then the space left between the guide plate *c*, and the surface of the hone, must be only as much as will receive the thickness of the back, and allow it to move freely backwards and forwards; in such case, also, the blade may be held exactly in the usual manner to produce the requisite pressure of its back and its edge upon the stone, without bearing the back upwards beneath the guide plate, by the twisting action above described; the guide plate being in such case only a security that the thick back of the blade shall not by accident or inadvertence be raised up from contact with the stone. It is only blades with thin backs, requiring their backs to be raised up from the surface of the stone, that the handle is to be held in the above-described manner with a twisting action, which will raise the back upwards in contact with the under side of the guide plate. Care must be taken to set the guide plate exactly parallel to the hone before commencing to use the apparatus.

"I have shown my improved apparatus at figs. 20 and 21, fitted with an elastic strop *f*, *f*, which is formed of an endless band of leather, encompassing two small stretchers *i*, *j*, which extend across the breadth of the strop within the loops formed at its two ends. The strop is supported by two small studs, which turn up from the ends of two plates of metal, which are screwed on each end of the block of wood. A pin projects out from the stretcher, and passes through the leather of the strop at one end, and is lodged in a hole in the stud. Two rods or strong wires are fastened to the stretcher, and extend parallel to each other, all the length of the strop withinside of it. The other ends of these wires pass through holds in the other stretcher *j*, and in the leather of the strop, and the extremities of the wires are fixed into a small bar, which presses against the stud, and a screw *k*, is inserted through the cross bar, which screws into the stretcher *j*, within the end loop of the strop: the shoulder of the screw bearing against the outside of the cross bar. By turning the screw *k*, the strop *f*, may be strained to such a tension as to render it a sufficiently firm surface for stropping the blade of a razor.

"The shoulder or round shank of the screw *k*, is received in a notch formed in the stud, and left open on one side, in order that the screw may be displaced sideways out of that socket, and then the pin at the opposite end of the strop may be drawn out of the stud, and the strop be entirely removed. It may be replaced with the other side upwards, or it may be used in the detached state.—*Note.* Such strops having been heretofore made form no part of my invention, and are only represented and described here to show how they are applied in concert with the apparatus which is my invention.

"Figs. 22 and 23, represent another form in which my improved apparatus may be constructed; fig. 22, is a section of the apparatus; and fig. 23, is a plan of the block. In this construction the object is the same as the preceding, viz. to guide the blade of the instrument which is to be sharpened, and to prevent the back from being raised too high off the surface of the hone. But instead of the hone being fixed, and the guide plate being caused to approach to, or recede from the hone by the regulating screws, in the manner hereinbefore described, the guide plate *c*, is firmly fixed by screws to the top of the block, so as to cover over the notch therein; and the hone *b*, is cemented and held fast by screws to a bed plate *g*, *g*, which is supported by the upright screws. The heads of those screws are countersunk into holes in the bottom of the block, and are screwed into the bed plate.

"The hone *b*, and its bed plate *g*, are forced up towards the guide plate *c*, by a long bent spring *h*, which is screwed by the middle of its length to the bottom of the notch in the block *a*, and lies interposed between that bottom and the underside of the bed plate, the two ends of the spring bearing the same upwards, by its elasticity, in opposition to the screws.

"The space between the hone *b*, and guide plate *c*, can be regulated by turning the adjusting screws, and causing the plate *g*, to rise or fall until it is set at the required distance. The spring *h*, must be made strong enough to prevent the hone yielding at all to the pressure requisite for sharpening the edge of the instrument properly.

"This apparatus is also furnished with a strop, which is strained and supported by screws mounted in studs formed at the ends of the guide plate, which turn up for that purpose; and the strop can be tightened or slackened, or entirely removed by means of those screws, as is sufficiently obvious.

"Instead of adjusting the guide plate by means of two regulating screws, as shown in fig. 20, it may be placed, as shown in fig. 24, being guided at each end by a pin on which it can slide up and down loosely. Two springs are interposed between the guide plate *c*, and a fixed plate, screwed on the top of the wood block *a*, over the notch. The place of the guide plate is adjusted by a screw, which is rivetted into the plate *c*, and passes up through a hole in the fixed plate, and a nut is applied upon the screw, where it comes up through the plate. By turning the nut the guide plate *c*, may be drawn up from the hone, or be caused to approach the hone.

"The construction of my apparatus may be varied, by using two hones with their surfaces placed opposite to each other, the second hone being fastened to the guide plate *c*, so that the back of the blade may apply thereto, instead of to the guide plate as above described. In this way the edge may be turned upwards, in order to sharpen it against the upper hone, the lower hone then serving as a guide to the back of the blade, to ensure that the edge shall be applied at a proper angle to the surface of the upper hone, in the same manner as the upper hone serves as a guide for the back when the lower hone is used. And when two hones are so disposed opposite to each other they may be chosen of different qualities, one being a coarse hone or oil-stone to sharpen a thick edge, and the other a finer hone to finish a fine edge.

"If the guide plate *o*, is made of soft yellow brass, it will, in some cases, be found to give a finish to a cutting edge after it has been finished on the hone to turn it upwards and rub it against the surface of such brass guide plate, in the same manner as it was before rubbed upon the hone, the edge being well supplied with the black oil which gathers upon the hone whilst it is rubbed up the brass plate.

"Although I have described my apparatus with regulating screws to adjust the space to be left between the surface of the hone and the surface of the guide plate, it is to be observed, that such regulation is only necessary in order to adapt my apparatus to whet or sharpen blades of different breadths and thicknesses at the back, and, therefore, when my apparatus is to be made for sharpening only one particular blade, or one particular size of blades, the guide plate may be immediately fixed at a suitable distance from the hone, whereby my apparatus will be simpler in its construction, but the same in effect, for sharpening the particular blades for which it is made.

"Figs. 25, 26, and 27, represent another form in which my improved apparatus may be construed; fig. 25, is a perspective view; fig. 26, a section; and fig. 27, a horizontal plan thereof. Two hones *b*, *b*, are received in an upright box *a*, which is mounted upon the larger box *d*, for a base; the hones descend through the box *a*, and also through the top of the box *d*, which has two oblong holes or slits cut out in it to receive the hones; the narrow piece of metal which is left on the top of the box, between those oblong holes, divides the hones *b*, *b*, and a double spring, in the form of the letter ᴜ, is inserted between the two hones. The two prongs of the double spring bear against the adjacent sides of the holes, and, by their elasticity, tend to force the hones away from each other.

"The hones *b*, *b*, stand upon a bearing plate *e*, which is supported by a screw *f*; the head is countersunk within a hole in the bottom of the box *d*, and the screw is screwed into the plate *e*, and the upper end enters into a hole in the top of the box *d*, whereby the screw is guided and kept perpendicular; a washer is fastened upon the screw, just above the bottom of the box, so that the screw cannot itself rise or fall within the box; but, by turning it round, it will raise up or depress the plate *e*, and the hones *b*, *b*, which rest upon that plate, so as to bring a new part of the length of the hones into action when that which has been used has become worn.

"The hones can be caused to approach each other in opposition to the elasticity of the double spring, by means of adjusting screws, which pass through the metal of the box *a*, and bear against the backs of the hones.

"A grooved trough *h*, *h*, is mounted upon a standard *g*, on on the top of the box *d*, by means of a round plug, which is formed on the underside of the trough, and inserted into a cylindrical hole in the standard; so that the trough can be directed towards any part of the space between the two hones *b*, by turning the plug round horizontally in its socket; and it can then be fixed in the standard *g*, by the thumb-screw.

"The end of the trough nearest to the hones may be adjusted by regulating screws, which are screwed through the ears of the small bracket *i*, which is fixed to the outside of the box *a*, whereby the trough can be placed in the required position with respect to the space between the hones, and retained between the points of the screws from any considerable deviation from that position; but it is desirable to leave the trough with a little liberty to play about its plug.

"The razor or other blade which is to be sharpened, is fixed in a small clamp *k*, between the two screws *l*, *l*; a stud, which projects from the lower part of that clamp, is fixed upon a cylindrical rod *m*, which lies in the bottom of the trough *g*, and is adapted to be slidden endways, backwards and forwards. The clamp *k*, is formed so that when it is quite vertical, its lower edges do not touch either of the edges of the trough; and then if a blade is fixed in the clamp it will pass clear between the hones *b*, *b*, without touching either of them; but if the rod *m*, is turned to one side or the other, the clamp will be tilted over, so that one of its bottom edges will bear upon the corresponding edge of the trough, and then the blade which is fixed in the clamp will also be tilted over to one side, and its cutting edge will be brought in contact with one of the hones.

"Care must be taken to adjust the position of the trough *h*, so that when the clamp is tilted over to one side or the other, the cutting edge of the blade shall be brought exactly in contact with the corresponding hone at the proper angle, with the surface thereof for sharpening, and no more; and the adjustment may be attained with great accuracy, by means of the several regulating screws hereinbefore mentioned, viz. those which act upon the stones, those which regulate the trough, and also those which hold the blade in the clamp.

"When the apparatus is adjusted the edge is sharpened by drawing the blade backwards and forwards in the direction of its length, with its edge in contact with one or other of the hones, the angle and direction of the blade being guided during such motion by the bearing of one of the bottom edges of the clamp upon the corresponding edge of the trough; the clamp being tilted alternately to one side or the other, in order to bring the blade into contact with each hone in turn.

"The clamp is intended to hold razors and large blades; but for penknives or blades of a small size, a smaller clamp *r*, (shown detached) is fixed into the clamp *k*, and that small clamp is provided with its own screws to fasten the blade into it.

"Having now described my apparatus, I do hereby declare, that what I claim as my invention, under the said letters patent, is the improvement of applying and fixing a guide plate, as hereinbefore described, over or opposite to the surface of such a hone or oil-stone as is or may be used for whetting or sharpening the blades of razors, penknives, or other cutting instruments; leaving only such a space or interval between the adjacent surfaces of the stone and of the said guide plate as will confine the back of the blade from being raised up any higher from the surface of the stone than is proper to give the edge the desired angle. Also, in applying two stones with their surfaces opposite to each other, and at a suitable distance apart, in order to whet or sharpen the cutting edge, first, on one side by one stone, and then on the other side by the other stone. And as to the particular modes hereinbefore described, of adjusting the distance or space between the stone and the guide plate, or between the surfaces of the two stones; and also the means of holding and guiding the blade during the motion which must be given to it, during such whetting or sharpening, the same may be greatly varied without departing from the nature of my invention as here set forth."—(*Inrolled in the Inrolment Office, January,* 1830.)

To Joseph Ange Fonzi, *of Upper Marylebone Street, in the county of Middlesex, Esq. for certain Improvements or Additions to Fire-places.*—[Sealed 9th September, 1829.]

The subject of this Patent is a peculiar construction of stove for heating rooms, and also for culinary purposes; one particular feature of which is, that by the arrangement of the parts, the fire is intended to burn downwards, and, consequently, to consume the greater part of its own smoke. The following is the Patentee's description of the invention:—

SPECIFICATION.

"My improvements on, or additions to, fire-places consist in giving to fire-places the form or forms hereinafter described, and also represented in the drawings hereunto annexed, in order that fire-places, constructed according to my improvements, may be adapted to burn coals by a downwards current of air and flame, so as to avoid the escape of smoke or vapour into the apartment in which such fire-places are placed.

"Description of the apparatus for the burning of coals, which is to be made of iron or any other suitable substance—I name it a '*Fonzienne.*' The form and dimensions may be varied at the discretion of the workmen who are to construct the same. I have adopted the following form and dimensions:—

"The fire is contained within a cast-iron box, without a lid or a bottom. It is fifteen inches square in the inside, thirteen inches high, and the metal two-thirds of an inch thick. (See Plate VIII. fig. 1.) At the lower part of the front side of the box is an opening, for the purpose of introducing a shovel to take out the ashes. This opening might be dispensed with, but it would then be necessary to take out the ashes at the top, which would be much less convenient. This opening is to be shut by a small door during all the time that the fire is burning. At the back part of the box there is a circular opening, six inches diameter, its centre being five inches above the lower edge of the box; to this opening the pipe or flue is joined to carry away the flame and smoke into the chimney.

"This box is placed (as shown at fig. 2,) on a pavement, composed of square cast-iron plates, two-thirds of an inch thick, which forms its basis or foundation, and supplies the place of the bottom to the box. Those iron plates may be dispensed with, it being possible to place the said box upon the chimney hearth, on a pavement of bricks or stone-work. Within the interior of the box I adapt a frame of cast iron, with four short legs resting on the bottom plates or pavement, the outside of the frame touching all the interior sides of the box. On this frame rests the horizontal grate, which is of the same size as the frame, and fills the box. The grate must be one inch in thickness or more. (Fig. 3, representing the frame, and fig. 4, the grate resting on the frame.)

The top of the grate is five inches above the basis, but it may be placed higher in the box, the height of the frame which supports the grate being made accordingly. On this horizontal grate another grate of the same thickness is placed, nearly vertically within the box, so as to stand sloping against the inside of the box, being joined to the superior edge of the posterior side or back of the box, in which side is the opening of the flue through which the smoke and flame are to pass away. The superior edge of this grate must join closely to the superior edge of the back of the box, but the inferior edge of the grate is kept about two inches and a half distant from the back of the box, by means of two short legs, which project out behind the grate, and touch the back, so as to make this interstice (fig. 5.), indicating this said grate, which stands nearly vertical. Or, instead of that grate, a plate of cast iron of the same thickness and size (shown at fig. 6), may be substituted, being placed within the box, in the same manner as above described; and other grates of the same construction may be adapted to stand in sloping positions against the four inward sides of the box (as fig. 7).

"The said plate of iron, which may be used in lieu of the back grate, and the number of the sloping grates which may be so applied within side of this box, serve to vary, at pleasure, or, as need may be, the quickness and intensity of the combustion of the coals contained within the box which forms the fire-place. The most active fire may be obtained by using the plate of iron at the posterior side of the box as aforesaid.

"If, instead of this plate of iron, a grate is used, then the consumption of the coals is less active; and it will be still more moderate if a second sloping grate is applied against the front internal side of the box, above the opening for removing the ashes; but the smallest fire is made by using all the four sloping grates hereinbefore mentioned against the four internal sides of the box; or the sloping plate of iron may be applied against the posterior internal side of the box in which is the opening for the smoke pipe (or flue), whilst three other sloping grates are applied in the other sides. In this case the plate of iron must be formed as represented by fig. 8. By these means any required degree of heat may be procured, either for a large or small kitchen, or for a large or small apartment.

"The draft or current of air which causes the fire to burn draws downwards through the burning fuel (and through the bottom grate upon which it rests) into the space beneath that grate, from whence it passes away by the smoke-pipe or flue, which is joined to the opening at the back of the box, and which conducts the smoke into the chimney.

"To obtain every possible advantage from this fire-place it will be necessary to make the following additions to the said apparatus, viz.:—To the four superior edges of the box is adapted a square border-plate of cast iron, extending out around the fire-place, nine inches broad or more on every side. The border-plate is fastened on the edges of the box by screws, and it serves to support all the culinary utensils, pots, saucepans, &c. which had been previously placed on the burning fire, for boiling or stewing. When situated on this border-plate they will still continue to boil; *a, a,* represents the border-plate. A suitable frame, like a stool, with legs, must be placed behind the box, at the back where the smoke-conducting pipe is joined to it. This frame must be of the same height as the box, and must touch the posterior edge of the border-plate. This frame is to support a reservoir or boiler, to contain water. The boiler may be made of copper, or any other metal, fourteen inches or more wide, one foot eleven inches high, and two feet long. A pipe of copper, five or six inches in diameter, open both at the top and bottom, passes vertically through the boiler, and is soldered to the middle of the top and bottom plates of the boiler, where it passes them. The top of the pipe rises up ten inches above the top of the boiler. At the lower part of this boiler is a cock to draw off the contained water, and at the top a hole to pour in fresh water. The lower end of the vertical pipe through the boiler joins by an elbow-turn to the opening at the back of the box where the smoke escapes, and the heat, which is, in consequence, conveyed through the pipe, is communicated to the surrounding water. The superior extremity of the said vertical pipe, where it rises above the top of the boiler, enters into an oven, composed of copper or iron plates, about two feet square, and one foot high. This oven contains another smaller oven withinside of it, in the manner of a drawer, leaving between them an interstice of two inches on all sides, except the front, where the door opens into the oven.

"In the centre of the upper part of the exterior oven is a hole, five or six inches in diameter, to which is adapted the conducting pipe, for conveying the smoke away to the chimney, the flame smoke and heated gas emanating from the burning coals contained in the fire-place, pass through the elbow-turn, at the back of the box, into the vertical pipe through the centre of the boiler, making the water within it boiling hot. Then the smoke passes into the interstice around the interior of the two above-mentioned ovens, and from thence through the superior conducting pipe into the chimney. (See *b*, fig. 2, representing the boiler or reservoir; *c*, the cock; *d*, the opening by which the boiler is filled; *e*, the vertical pipe which passes through the boiler *b*, the oven *f*, and the conducting pipe *g*, for the smoke.)

"The fire-place may be elevated to a more suitable height, so as to save the trouble of stooping, by placing the whole apparatus on a basement of brickwork, or supporting it on a suitable frame. In that case the part of the vertical pipe which is between the boiler and the oven may be removed, and the oven placed on the boiler, that the oven may not be too high from the ground.

"The apparatus may be constructed in a different manner, as follows:—The box to contain the fire may be made one foot and a half long, one foot wide, and one foot high; the metal two-thirds of an inch in thickness. A frame and horizontal grate is fitted into this box in the same manner as in that before described, also the door in front to remove the ashes; but there is no opening at the back for the smoke-pipe. The back plate, which has been before called the sloping plate (or the grate which is to be used in lieu thereof), is to be placed vertically at a distance of six inches from the posterior side of the box, leaving a space of one foot square to receive the burning fuel, and a space of six inches by one foot behind the plate or grate, for the flame and smoke to ascend in, after having passed down through the burning fuel and the bottom grate. Over this latter space is placed a box, one foot long, and six inches wide; the height at pleasure. It is open at the bottom, but closed at top, and receives the smoke and flame within it. To the posterior part of this box is adapted a conducting pipe. Fig. 9, represents the box; *h*, the space between the vertical grate and the posterior side of the box or fire-place. Fig. 10, is the upper box; *i*, the opening to join to *k*, the conducting pipe for the smoke. Fig. 11, is the whole apparatus put together.

"Another construction for the same apparatus is shown at fig. 12. Instead of covering the posterior part of the apparatus with the upper box it may be covered with the border-plate, which will extend itself around all the superior edges of the box, and cover over the space of six inches intended for the smoke to ascend in. Over the middle of this space of six inches a vertical column, five or six inches in diameter, and three feet high, is placed on the border-plate, and conveys the smoke upwards. On the top of the column the oven is placed as before described. The heat will pass up through the column into the interstice between the two ovens, and from thence will escape by the upper conducting pipe into the chimney.

"Another manner of constructing the apparatus. If two of these apparatus are required to burn at once, they may be placed one by the side of the other in contact, and, instead of placing an upper box on each, one upper box, two feet long, may be placed across over both, as in fig. 13, to receive the flame and smoke arising from both, and from that long upper box it may pass through a single conducting pipe, joined to the middle of the posterior part of the upper box. On the two apparatus which are so placed side by side, instead of an upper box may have two vertical columns placed on their border-plate, over the spaces in which the smoke rises. In this case the oven must have two holes to receive both columns, as in fig. 14. If two apparatus so placed side by side are required to have a boiler behind them, that boiler may be about double the breadth of the boiler hereinbefore mentioned, or larger; and it must have in its inside two vertical pipes, which will enter in the two holes made in the oven instead of the columns, as fig. 15. The said apparatus, whether single or united, must always be surrounded by the border-plate on the top edge, and the sloping or vertical plate of iron, or the sloping or vertical grates like those in the first-mentioned apparatus, are to be used to procure all the required degrees of heat.

"To make use of the said apparatus fill the interior of the box with coals, and cover the upper part either with a cover-plate, divided into two, or else with two kettles of water, which, when set side by side on the coals, will cover over the upper part of the box; leave uncovered a small part of the coals between the two parts of the cover, or the two kettles, and in that opening put a shovel full of burning charcoal, or of lighted wood, which will set the coals beneath it on fire. As they kindle push aside the divided cover, or the two kettles from each other, and, when the whole of the coals are on fire, take away the covers or the kettles, and the fire continues, without occasioning the least smell or smoke, because the current of air is drawn downwards through the whole mass of burning fuel, and, after passing down through the bottom grate, rises up again in the space left behind the sloping plate or sloping grate, and from thence the smoke passes away through the conducting pipe to the boiler and the oven, and ultimately to the chimney. Fig. 16, shows the covers, fig. 17, the kettle.

" After having tried experiments with this said apparatus I have found the following alterations advisable to adapt it to different purposes :—For the simple warming of rooms the apparatus represented in fig. 11, may be made sixteen inches high at the posterior part, and only nine inches high in the front part, so as to make the top edges of two sides of the box with a slope towards the front side. The sloping must begin at a distance of six inches along the lateral edges from the back of the box, in order that so much of the said edges as are to be covered by the upper box, as fig. 13, may remain in a horizontal plane; and all the rest which is left open for the fuel is inclined, so that the burning fuel will lie higher at the back than at the front.

" This apparatus, like the others before described, with the upper edges horizontal, is open at bottom, and is intended to be placed on the floor; but it must have a bottom plate of the same size as the bottom of the box, and one-third or half an inch larger all round, for a raised border, into which the lower edges of the box are fitted. This bottom plate is to be of the same thickness as the box, or a little more. The raised border must be interrupted in the front part before the door at which the ashes are to be withdrawn, in order that the door may be put in and taken out easily. The edge of the bottom plate must advance at least one inch forward in front of the opening of the door. This bottom plate may be raised from the floor by means of legs, or any other method, so that the air, in circulating under the bottom plate, will prevent the fire from over-heating the pavement or plates of iron under the box, or from communicating fire to any beam or wood work which may be underneath that pavement.

"The divided cover-plate for the apparatus to inclose the coals when the fire is first lighted may be made in various forms, more or less ornamented. The superior edges of the said apparatus may be surrounded by a border-plate, of a square or an oval shape, of the same size internally as the interior of the box or fire-place. (See fig. 18.) And to the external part of this border-plate, and also to the sides of the box, lugs or projections may be added, to fasten plates of iron or copper to, by screws, the size of such plates being according to the dimensions of the chimney, which may be ornamented by such plates in any style of elegance or taste required. The border-plate itself may be of iron or of brass, gilt or varnished, not being subject to be blackened by the smoke or coal dust, which can never affect it.

"To procure suitable intensity of combustion and of heat in the last-mentioned apparatus, a sloping grate, of the kind hereinbefore described, may be inserted into the posterior part of the box, resting upon the horizontal grate, and joining to the superior edge of the back of the box, but detached from that back at the bottom part of the sloping grate, like the other sloping grates already described. Likewise two other sloping grates may be placed in the sides of the box, joining at the top to the edges of the box, and at the bottom to the bottom grate. The latter sloping grates must not extend the whole length of the inside of the box. It is enough that these grates are half or two-thirds of that length.

" To make the most of the heat which radiates around all the apparatus described, a frame, one foot high or more must be constructed, and a wide and thick platform put upon the frame, the box or fire place must be placed in the centre of the platform, and then the other bottom plate to the box may be dispensed with. The box must have its border plate fixed around its superior edge, as before described. The apparatus thus placed on a platform, is at a suitable height for all domestic purposes. The boiler may be placed on the posterior surface of the border plate, making the conducting pipe for the smoke and flame pass through the border plate, and fit into the vertical pipe within the boiler; that pipe rises a little above the boiler, that it may also fit into the iron case containing the oven, which may rest on the boiler.

" The height of the frame for supporting the apparatus, and of the frame for the boiler, and the oven at the top of the boiler, must be such that the cook may perform the various operations with ease. If it is desired to keep the whole of the border plate disengaged, a large frame must be placed on the floor, at the posterior part of the apparatus, the frame being of the same height as the posterior edge of the border-plate ; the boiler is to be placed on this frame, and on the boiler the oven is to be placed.

" The oven that is applied to each apparatus, must be of a size in proportion to the quantity of fuel contained in the apparatus; the interstice between the iron case and the oven that is included within the case, must be two inches wide, or a little more.

"If it is requested to keep the oven always hot, even when the fire has decreased, then the interstice must be more than two inches wide, and the case must be lined with tiles or brick work within side. These refractory and slow conducting materials will keep in the heat a long time; and the fire being kept up, though not so strong as at first, will maintain more than sufficient heat in the oven for baking pastry or roasting meat.

"When two apparatus are to be joined side by side under one large border-plate, the boiler may be placed thereon, that boiler having in the inside of it two vertical conducting pipes; or it is still better to place the boiler on a larger frame at the posterior edge of the boiler plate, as before stated, for a single apparatus; or if the boiler has only one vertical pipe through it; the apertures for the smoke and flame at the posterior side of each apparatus, must be adapted to the two branches of a forked pipe, running into one pipe, the top end of which fits into the bottom vertical pipe of the boiler.

"The boxes or fire places of the apparatus may be constructed in any form or size, besides those hereinbefore stated, but the capacity to contain coals must have its limits, for if excessive, the grates and the iron plates, and the internal frames, may be injured by excess of heat. The box must not be too small, or it will be unsuitable, for it should contain a sufficient quantity of coals to continue burning a long time. If the capacity is too small, the fire will go out when it becomes abated by too early a consumption of the coals.

"The horizontal grate, fig. 4, before mentioned, as being placed inside the box or fire place fig. 1, near to the bottom thereof, as well as the frame, fig. 3, to support the horziontal grate, may be dispensed with, by making horizontal rows of holes, about one inch and a half diameter, through two opposite sides of the box, at three inches and a half above its base, and at such distances apart as to leave spaces of about one-third or half an inch of solid metal between the holes; and inserting into those holes cylindrical bars of wrought or cast iron, of the same diameter as the holes, and extending horizontally across the inside of the box, in order to sustain the burning fuel, in lieu of the bars of the horizontal grate, which, as before mentioned, is laid aside. These bars will resist the action of the heat for a long time, and when after much use they become damaged at the part within that side of the fire place where the heat is most considerable, they may be removed, and others applied in their stead. It is not absolutely necessary to make holes through the sides of the box, in order to insert such cylindrical bars, for they may be lodged on two supports, as fig. 19, at the bottom part of the lateral sides of the interior of the box; or instead of solid cylindrical bars, I make use of hollow cylindrical tubes of cast or wrought iron, through which the exterior air may pass in a current, which produces the double effect of cooling and carrying off the excess of heat caused by the combustion at the bottom of the box or fire place, and consequently the slackening of the burning of the fuel therein contained. Also the heated air which issues from the open ends of those tubes, will give heat to any articles which are placed opposite thereto, and by rising up beneath the platform gives heat thereto, and to any of the vessels that may be placed thereon, in order to keep the contents thereof boiling, as before stated.

" To increase or diminish the temperature of apartments which are warmed by my apparatus, the ordinary chimney of the apartment, which is closed at bottom, in order to cause a draft or strong current of air through my apparatus, should have a valve or sliding damper, or ventilator applied in it at the lower part of the chimney, where it is shut up, so as to open a passage for air, and to open more or less passage at pleasure, in order to draw the air from the apartment up the chimney, and thus change the air and diminish the temperature of that which remains.

In building new houses, where it is intended to use my apparatus, I recommend the following plan, in lieu of the usual brick chimneys. A niche or hollow place should be left in the wall within side the house, and extending up through all the height thereof, from the kitchen to the highest story. Into this niche in the wall, which may be one foot and a half wide, and six or more inches deep, a hollow rectangular tube or funnel of cast iron should be adapted, so as to fill the niche; the said tube being made in convenient lengths, joined one to another, end to end, so as to make a continuous funnel up from my apparatus to the highest apartments, and the smoke-pipe of my apparatus being joined into the said cast iron funnels, (instead of being joined into the ordinary chimney, as before directed) the smoke, heated air and flame from the fire, will ascend through the said metal funnels, and heat will pass through the metal thereof, so as to give some warmth to the air contained in all the apartments that are situated above, that where my apparatus is placed, without the necessity of making a separate fire in each oven, and thus the danger of accidents from fire will be avoided.

" In order to clean out the inside of these iron funnels, small doors must be made in the front at suitable distances one from the other; such iron funnels may also be substituted for the chimneys as now constructed.

" Having now described my apparatus, and some of the variations that may be advantageously made in construction thereof, to adapt it for different purposes, I do hereby declare that what I claim as my improvements on or additions to fire places is the internal arrangement of the parts of my apparatus hereinbefore described; the object of that arrangement being for the purpose of applying the known principle of supplying the air which is to support the combustion of coals at the upper surface of the fuel, with a descending current through the mass of burning fuel, by virtue of which internal arrangement I am enabled to regulate the degree and rapidity of the combustion of the fuel, and apply the heat evolved by the combustion so effected by the downwards current to all domestic purpurposes, without allowing smoke or smell or dust to escape into the apartment in which the apparatus is placed."—*(Inrolled in the Inrolment Office, March, 1830.)*

To **Thomas Aspinwall**, *of Bishopsgate Churchyard, in the City of London, Esq. in consequence of a communication made to him by a certain foreigner residing abroad, for an improved method of casting printing types by means of a mechanical process, which invention he proposes to call the Mechanical Type Caster.* —[Sealed 22d May, 1828.]

This invention is a machine for casting printing types, in which the several parts of the mould are moved by mechanism, instead of being opened and closed by the fingers of the workman. The whole of the invention is described by the accompanying drawings (see Plate VII.) and following description.

SPECIFICATION.

"That is to say, fig. 5, is a plan or horizontal view of the machine or apparatus, when the parts of the mould have been withdrawn from the melting pot, and are separated, after having cast and delivered a type. Fig. 6, is another plan view of the machine, when the parts of the mould are brought together, and closed previous to receiving a jet of hot metal from the melting pot to cast another type: fig. 7, is a side view of the same, (the melting pot and furnace being shewn in section,) fig. 8, is a front view of the mould when put together, with the parts by which it is connected to the machinery: fig. 9, is a top view, and fig. 10, is a side view of the same. The same letters and figures of reference refer to similar parts in all these figures; *a*, *a*, *a*, *a*, is the metal bed or swinging table, upon which the working parts are mounted, and which is suspended by the wires and swivel adjusting screws, *b*, *b*, *b*, *b*, as shewn in fig. 7; *c*, is the crank shaft, through which motion is communicated by the winch handle *d*, to the whole of the working parts of the apparatus: *e*, *e*, are the parts of the mould, in which the type is cast; *f*, is the melting pot, with the furnace *g*, under it. On motion being communicated to the handle *d*, in the direction of the arrows; the crank *h*, moves the connecting rode *i*, sliding bar *j*, *j*, and cross bar *k*, *k*, forwards, towards the melting pot.

"On each end of the cross bar *k*, *k*, are attached one end of each of the barrel springs *l*, *l*, their other ends being connected to the sliding carrier pieces *m*, *m*, *m*, on which the parts of the mould *e*, *e*, are mounted. As the cross bar *k*, *k*, is moved, the springs *l*, *l*, draw the carrier pieces *m*, *m*, and the parts of the mould *e*, *e*, forward, until they meet the pieces *m*, *m*, being guided by the ribs *y*, *y*, and keep them in close contact during the further operation of the machine, the screws *n*, *n*, which keep the carrier pieces *m*, *m*, down upon their bearings on the table, working in grooves or slits; the continued movement of the crank projects the sliding bar *j* further forwards, the cylindrical part of the bar sliding through the guide collar *o*, which is kept central to the machine by the pieces *p*, *p*, each connected by joints at one end to the collar, and at the other end to the carrier pieces *m*, *m*. On the end of the sliding bar, *j*, is the upright piece *q*, (see fig. 7,) carrying the projecting piece *r*; which, as it is moved forward, coming in contact with the adjusting screw *s*, on one end of the bent lever *t*, causes it to turn on its centre, and by the friction roller on its other end forces down the piston or plunger *u*, thus pressing the hot metal out of the cylinder *v*, into the chamber *w*, and forcing out that previously in it, through the small pipe or nozzle *x*, into the mould, as it is moved forward, to receive it by the friction roller 1, of the cam, on the crank shaft *c*, acting against the upright piece 2, fixed in the frame or table 3, 3, 3.

"The swinging table, *a*, *a*, being thus projected forward, until the end of the nozzle *x*, enters the mouth of the mould, which receives the jet of metal as it is projected out of the chamber, and the type is cast. The handle *d*, is then moved the reverse way, and the friction roller 1, ceasing to act against the upright piece 2; the table is allowed to swing back into its former position from the manner in which it is suspended out of the perpendicular and horizontal position. The piston or plunger is then raised by a spring from which it is suspended by the wire 4, but which is not shewn in the drawings, and it is prevented from rising too far by the stud 5, coming against the guide collar 6, (see fig. 7,) and as it rises the hot metal in the melting pot is allowed to enter the cylinder through the holes formed around its top, which are closed by the piston as it descends, thus preventing the metal from getting out of the cylinder *v*, in any way, but in the chamber *w*.

"The movement of the handle being continued, the sliding bar *j*, *j*, and all the parts fixed thereon, move backwards into their former position, as shewn in fig. 5, and the parts of the mould separate. On the upright piece *q*, is affixed another projecting piece 7, which carries the hanging tooth 8, and which tooth, as they retreat, slides in the groove 9, acting upon the bent lever 10, depresses it; the other end of this lever acts upon and raises another lever 11, (see figs. 9 and 10); this lever has an adjusting screw 12, pressing upon one end of the matrix 13, which is thus disengaged from the type; the spring 14, which keeps it in its place during the operation of casting, giving way to the pressure. On the mould opening, the cast type is loosened from that part of the mould to which it adheres by the inclined plane piece 15, fixed in the swinging table acting upon the end of the rod 16, (its head being countersunk in the side of the mould plate), and projecting it forward, loosens the type and its cast. Jet *s*, which falls away below the spring 17, attached to one end of the rod 16, draws the rod back again, when the parts of the mould are made to close, it having again passed by the inclined plan piece 15. In order that the parts of the mould attached to the carrier pieces *m*, *m*, may move forward toward the melting pot, with the same speed, and meet together without striking, the regulating angular piece 18, is attached to the sliding bar *j*, *j*. Upon the angular sides of this piece the adjustable studs 19, 19, affixed on the carrier pieces *m*, *m*, act and govern the force of the springs *l*, *l*.

"When different sizes of type are to be cast, the mould is altered in the usual way, and, in order to accommodate the machinery to such adjustment, the pieces 20, 21, which connect the parts of the mould to the machinery, can also be moved. On the under side of the piece 20, is a groove (shewn by dots in fig. 9,) fitting on to a projecting rib on the carrying piece *m*, *m*, and this piece and the parts of the mould connected to it by the bolt and nut 22, can be moved nearer to, or farther from the centre of the machine, as the size of the type may require by loosening the screws 23, 23, which work in slits, and allow it to slide along the rib. The other half of the mould is connected to the piece 21, by a bolt and nut 22, in the same way as the former; but as it must be adjusted to the other half, there is no groove or rib, but on the carrying piece *m*, is the fixed piece 24, and its adjusting screws 25, 25, which, when this half of the mould is properly adjusted to the other, are to be screwed up tight, to prevent the piece 21, from getting out of its proper position, it being fixed down upon the carrying piece by the screws 26, 26, in the same way as the piece 20.

"In order to regulate the height of the mould and swinging table, the suspending wires *b*, *b*, are furnished with adjusting screws and swivels, by which the inclination or height of the mould and table may be made to suit the type to be cast.

"The distance which the swinging table is to move backwards and forwards, is regulated by the upright piece 2, which can be moved further from or nearer to the crank shaft, by turning the screw 27, which works in the female screw 28, and sliding piece 29, on which the upright piece 2, is fixed. The swinging table is made to move centrally to and from the nozzle of the melting pot, by the ribs on its under sides working between the adjusting screws 30, 30, mounted upon the stationary table 3. Round three sides of the nozzle *x*, of the melting pot, there is a guard piece 31, (see fig. 7,) which prevents the hot metal from flying about, on the jet being thrown into the mould, and also causes the extra metal to fall into the dish 32. To prevent the handle *d*, from being moved too far either way, the bridge piece 33, is fixed upon the table, which prevents the connecting piece *i*, from rising too high, and consequently the handle from being turned too far either way.

"When it is wished to move the swinging table and parts connected to it from the melting pot, the upright piece 2, is to be removed, and the table will swing back into the perpendicular position."

"I do not hereby intend to claim, as my invention, any of the parts separately, or which are already known or in use, but the improved method of casting printing types by means of the mechanical process and arrangement of machinery herein described I particularly claim, and more particularly the manner of suspending the swinging table out of the horizontal and perpendicular position. The mode of moving the table with the parts of the mould towards the melting pot. The manner of bringing the parts of the mould together, and keeping them closed during the operation of casting the type. The mode of putting the working parts in operation through the crank shaft, assisted by the other parts described. The manner of adjusting the parts of the mould and apparatus, and also in using the chamber *w*, through which the hot metal passes from the cylinder *v*, into the mould, all of which form part of my improved method of casting printing types.

Specification drawn by Mr. M. Berry.

To LEMUEL WELLMAN WRIGHT, *of Mansfield Street, Borough Road, in the county of Surrey, Engineer, for his having invented or found out certain Improvements in machinery for cutting Tobacco.*—[Sealed 21st August, 1827.]

THE construction of this engine bears a close resemblance to the machines with revolving knives employed for cutting straw into chaff. The tobacco intended to be cut, after being pressed into cakes in the usual way, is placed upon a smooth bed within a horizontal trough, and pressed on the top by a follower and screws to keep it compact. The cutters are formed by blades or scythes, mounted on the arms of a fly wheel, which revolves in a vertical direction close to the end of the trough, and by that means slices off so much of the tobacco as projects out at the end of the trough, these blades being adjustable by screws.

When the portion of tobacco which projected forward from the end of the trough, has been sliced off by the passing knife, it is necessary to bring another portion forward, to be cut off by the next knife in passing, and so on; the tobacco being progressively advanced upon the bed to meet the revolving knives, which contrivance is called the feeding. This is effected by a follower and longitudinal screw, which acts against the back of the trough, and is kept continually turning, and consequently the tobacco continues to advance toward the knives as long as the machine is in action.

The particular feature in this machine, and in which it differs from the chaff cutters, appears to be the means by which the tobacco is brought forward. This is effected by a small pulley fixed on the end of the fly wheel shaft, which shaft passes under the bed, and from this pulley a band is carried to a large pulley fixed on the end of the longitudinal feeding screw. Hence it will be perceived, that as the fly wheel, with the cutters, is rapidly driven round the pullies and band, will cause the feeding screw to turn slowly, and to bring the tobacco progressively forward to the knives to be cut.

The speed with which the feeding screw turns, determines the degree of fineness of the ribbons or filaments, into which the tobacco leaves are reduced; and hence a small pulley, placed upon the shaft of the feeding screw, will produce course cut tobacco, while a larger pulley, placed upon that shaft, will cause the tobacco to be cut into fine filaments.

When the whole of the cake of tobacco has been cut, it is necessary to return the follower and screw, ready to receive another cake. This is done by a weight and cord, which is wound up on a small drum connected with the leading screw, during the time it revolves in pushing the tobacco towards the knives. And on the pulley of the leading screw being thrown out of gear, the weight descends, carrying round the screw shaft and drawing back the follower.—[*Inrolled in the Inrolment Office, Feb.* 1828.]

To Thomas Morgan, *of the parish of Tipton, in the county of Stafford, Manufacturer of Tin Plate, for a new method of manufacturing or preparing Iron Plates, or Black Plates for tinning.*—[Sealed 9th September, 1829.]

The object of the Patentee is to dispense with that operation in preparing black iron plates for tinning, called scaling, instead of which he employs a process called clearing.

The specification describes the iron plates as being made by first passing bars of iron between smooth rollers, for the purpose of flatting out or spreading them thin; and observes, that the bar, before it is operated upon, should be rendered as clean and free from scales as possible; and after being so rolled out, before the metal has cooled, it is to be plunged into water, for the purpose of clearing it of any scales that may have formed in rolling.

After this the flatted bars are to be cut into suitable lengths, and rolled again still thinner, which forms them into plates, taking care that they are not over heated in the thick state, and that a clear blue flame be kept up in the finishing furnace, in order that the plates may be kept free from scales, and as soft or mellow as possible.

SPECIFICATION.

" In cutting the edges of such plates as are intended to be annealed together in a box or case, as hereinafter is mentioned, care should be taken to make them square or true, and of equal size, so that they may be placed evenly in the box, and none of their edges projecting beyond the rest, by which means they can be better annealed than otherwise they could.

" When the black plates have been thus prepared, they must be cleared or pickled in sulphuric acid, or oil of vitriol and water, in the same manner as is now adopted in the scouring room in the last process prior to tinning. Muriatic acid or spirits of salts, and perhaps some other acids might be used in this process, but sulphuric acid is believed the best.

" The object of thus clearing or pickling the plates, is to remove all oxydized and other rough and hard particles from their surfaces; but they do not require to be so perfectly cleared as in the last process prior to tinning. Scouring is unnecessary in this process, the acid being sufficient to remove all particles from the surface of the plates which would mark or injure them in cold rolling.

"The pickle should be heated, and bran and saw-dust may be used therein, as is the usual method of clearing or pickling the plates in the scouring room prior to tinning; and the plates must be kept well separated from each other, and not worked too tight, and occasionally agitated and kept in motion during the process, so that the pickle may pass freely between them.

"The plates will be found more difficult to clear in this process than in that prior to tinning, and will require to be kept longer in the pickle for that purpose; but the length of time cannot be specified, as they must remain till they are tolerably clear.

"About half a box of black plates may be cleared at once in a hole or cistern of ordinary size, that is to say, about twenty-three inches in length by fourteen in breadth; and if the plates have been cold rolled, a greater number may be cleared at once in a hole of the above size.

"To make the pickle of proper strength, about three quarters of a pound, or from that quantity to a pound of sulphuric acid, will generally be found sufficient to a gallon of water; and when a hole of plates has been cleared, about two quarts, or from that quantity, to a gallon of the pickle should be taken out of the hole and replaced by fresh pickle of similar strength for each following hole of plates. The strength of the pickle, however, and the quantity necessary to be changed with each hole of plates cannot be accurately stated, as they will vary with the quality of the plates, the heat of the pickle, and the strength of the sulphuric acid.

"Instead of throwing away such pickle, as is above directed to be taken out of each hole after the plates have been cleared, it will be well to put it into another hole or cistern; and any plates which are difficult to clear, may be pickled twice by putting them fresh into such last-mentioned hole or cistern, (which may be kept up by occasionally adding a little fresh pickle if necessary,) there to remain till they are removed into the hole or cistern in which they are to be cleared as above mentioned.

"As the outside plates are often difficult to clear, it would be better to have them pickled separately from the others, being first enrolled if necessary.

"When the plates have been thus cleared they should be washed and placed on their edges apart from each other to dry. The drying should be effected as quickly as convenient; and for that purpose, the plates should either be dried on a stove, or dipped in hot water previous to placing them on their edges to dry; and if it be intended to anneal them in a box or case, it will be better to use the hot water, and add to it a little quick lime, the more effectually to remove any acid adhering to the plates.

"When the above process (which will prevent the necessity of scaling the plates) is completed, the plates should be cold rolled in the usual way, and afterwards annealed by either of the methods now in use, (that is) either by steeping the plates in diluted muriatic acid and heating them in an open furnace, or by inclosing them in an iron box or case in which they are annealed without the use of muriatic acid. In case of annealing the plates in a box they should be pressed tightly together, so as to admit as little air as possible between them, and the box must be allowed to cool before it is opened.

"Boxes of various constructions have been used for annealing the plates; but those which I have found most convenient have been about an inch and a half longer and broader in the clear than the plates they were intended to anneal, and from four to five inches deep in the clear, with two upright pins on each side of the box, placed about three or four inches from each end, and fastened against the sides, or rivetted through the bottom of the box: the pins may be either round or square, and about half an inch in diameter, and they should stand as far above the top of the box as to reach about an inch and a half above the lid when it is fitted down on the box.

"The lid should be provided with corresponding holes to let the pins pass. Through each pin there should be an opening the long way of the box about the eighth of an inch in width, and an inch in length, and commencing half an inch from the top of the pin, to let in a wedge, which, when driven in, will force down the lid, and keep the plates tight together; for which purpose, as many plates must be put in each box as it can possibly hold consistently with the shutting down of the lid. The lid, sides, and bottom of the box may be about half an inch in thickness, and the sides should be rebated for about half an inch from the top, and the lid made to fit the rebate, so as to be level with the sides of the box when it is on.

"The plates having been annealed are to be pickled or cleared, and scoured in the usual way prior to their being tinned, and it would be well to take out of every hole about a gallon of the pickle after the clearing of such box and plates, and to supply the place with fresh pickle. The pickle so removed, may be used in clearing or pickling the black plates the first time, in the manner hereinbefore directed to be adopted, instead of scaling.

"When the plates have been annealed in a box, it sometimes happens that they do not clear in the scouring room prior to tinning so readily as those which have been annealed in an open furnace. In this case, it may be well to take them out of the pickle when about half cleared, scour them in the usual way, and then return them into the pickle, and complete the process of clearing. They will not afterwards require to be again scoured prior to tinning, washing being in this case sufficient."

The Patentee concludes by saying, "I have detailed the ordinary processes for preparing the plates for tinning, not with a view of claiming them as my invention, but because many manufacturers omit some of the particulars hereinbefore described, whereas it is important that they should all be attended to, in order to obtain the best result from my method of manufacturing. And I claim, as my invention, the adoption of a process as hereinbefore described, of clearing instead of scaling iron or black plates, in the course of preparing them for tinning, and previous to their being cold rolled and annealed, whereby the iron lost in the scaling is saved, and a better article produced at a cheaper rate."—[*Inrolled in the Inrolment Office, March,* 1830.]

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REPORT

Of the Select Committee of the House of Commons on the Laws of Patents.

(Continued from page 182.)

Mr. John Farey, called in; and Examined.

The greatest length of time for which a patent can be granted is fourteen years, is it not discretionary with the Attorney General to grant it for less if he pleases?—I am not aware of the fact, but I suppose it is.

Would it be advantageous to the public, that patents might be taken out for a shorter time than fourteen years, supposing that there was a correspondent diminution of expense?—That is the practice in all other countries, but I am scarcely prepared to make up my opinion upon it; it would tend to multiply the number of patents for trivial inventions, which I think is not desirable, because they occasion so much litigation, and that evil would remain, if patent rights were rendered more secure by better law. Shorter terms, at less cost, would be utterly unavailable to patent rights for inventions of importance, which so much require amendment at present; because there the evil is, that fourteen years is too short. In my opinion fourteen years of profitable exercise of an invention is always sufficient, if it has not been preceded by loss that is to be repaid. The question is, whether a part or the whole of that term may not pass away before the profitable exercise begins. An invention which has no such term of unprofitable exercise, might be very well repaid by five years, as in France; but if it is an invention of any importance, there is always a period of positive loss and outlay, and then another period of unproductive exercise, before gain begins. The difference of cost between a five years, and a fourteen years patent, would be of no consequence to patentees of important inventions, where a great outlay of capital is always contemplated. I do not see how the public are ever to get any benefit from it. Patents for profitable objects would always be taken for the longest term, and unprofitable ones become extinct of themselves. It would be only enabling the patentee to save a small sum of money, and inducing a poor man, for the sake of doing that, to forego a part of the advantage he might derive from his invention. My observation supposes the length of the term to be left to the option of the patentee; if the term could be adapted to the nature of the invention, by a discretionary power, very great benefit might arise, if that discretion were wisely applied; but as there is every chance that it would be misapplied, and would then do excessive injustice and injury, I would by no means recommend any such discretion.

Does not it often happen, that after a person has taken out a patent for an invention, he makes some material improvement in the invention which at present requires another patent?—It is a very common case for the same invention to require two, three, and four successive patents; and it is a very great hardship, it operates prejudicially to the public as well as to the inventor. I have known a case where an inventor obtained a patent, and not more than a week after lodging the specification, he made a material improvement upon what was specified; the improvement is so great, that it would supersede his present article, which is a good one, and sells well; and yet if he practised the last and best edition, his former patent might be brought in question, and therefore he keeps it a secret and does not practise it at all; some time or other he may apply for a new patent, when his old one is expiring, or by his death it may be lost.

In such a case, would not the inventor be in a much better situation, supposing he had taken out a patent for five years, with the power of adding his improvements to the patent, so as to make it then a patent for fourteen years?—If you grant patents for a short period, and allow them to be extended, on paying fees and adding new improvements, there can be but little objection to that; it is the system now in use for the copyright of books, nor do I see any advantage; because reducing the cost in the first instance would come to the same thing, which, as I said before, is objectionable, so long as there is no other check to the excessive multiplication of patent rights, than the cost of obtaining them.

Would not the arrangement proposed in the last question be an advantage in such a case as you have mentioned?—No; because that case merely requires successive specifications to be received, as improvements arise; the last specification, like a man's last will, to be definitive. That is an important arrangement, which is established in France; there, as improvements arise, successive specifications of those improvements can be added (at very little expense) to the original specification, and thus give validity to the patent, even though the first may have been imperfect.

Would not that be very advantageous?—Very advantageous indeed; here there is no remedy for a defective specification at present. When a patentee is compelled to specify his invention within six months, which is the longest period that can be obtained in ordinary cases, if he is not then prepared to specify his invention, with all its details of execution, in a perfect manner, his patent right must take the chance of his imperfect specification; and although he may come to know how to make it perfect the next day, he has no remedy whatever; he has no means of putting upon the roll that additional perfection which he attained in the means of execution, even the next day after specification was enrolled; and if he practises the invention in a better manner than that which he specified, instead of its being held that he is deserving of public approbation, for having pursued his course of invention further than at first, the courts of law assume that he has committed a fraud, by concealing something which he ought to have put into the specification.

Supposing he makes an improvement in the course of two or three years after taking out his patent, what is the effect of that?—The effect is the danger of overturning his patent, if he practises the improvement, or departs from his specification in his practice.

In such a case, would not the ground upon which the patent was overturned be upon the supposition, that at the time of his making the specification he concealed something with which he was acquainted?—Yes; and he can only refute that imputation by proving in evidence, that the specification described does contain sufficient instructions to enable the public to exercise the invention with full advantage. It is impossible for him to prove the negative, that he did not know the improvement at the time of specifying. When a man invents and takes out a patent for a steam engine, steam coach, or a lace machine, or a mule to be worked by power, six months is the utmost he can get for preparing his specification; he uses his utmost exertion to get his engine made, and put to work, before the time when the specification is due, in order to make a trial of it, and regulate his specification by that trial; perhaps just before the time when he is expecting to get it to work, some part fails, or requires to be re-made, which prevents his making any trial, and the time being come, he is not able to try his engine before he must put in his specification, which he therefore makes as well as he and his adviser can guess, without any trial, though he has gone through nearly all the trouble and expense of a trial; then a few days after, having enrolled, he finds out, upon experiment, some most important improvement in the means of carrying his invention into effect, which either had not occurred to him before, or if he had thought of it, he could not have safely put it into the specification, because it was a mere speculative idea. If he had put in that speculative idea, and it had turned out on subsequent trial to be wrong, it would be said in a court of law this is a blind, this is nonsense, to mislead the public from the real invention, which he reserved for his own private practice.

In that case the inconvenience arises from want of time?—Yes; and the expense of those hurried proceedings, to get a sufficient trial of new machines to enable us to specify properly is excessive, being frequently obliged to keep people working night and day. I have sat up all night many times myself, for such work, and have undergone such fatigue, that I could not be any way sure of what I was doing. Even when a successful trial has been accomplished, there remains so little time afterwards, that the specification must be composed in such haste as to run the greatest risk of some inaccuracy or error.

Supposing a specification to be so accurately drawn as to be sufficient to inform the public how to use the invention at the time that the invention is enrolled, and that subsequently to that, the inventor discovered some improvement in his invention, his patent is not forfeited by his using that improvement?—No, not by law; but he must prove that his original invention would answer the purpose proposed, and be a useful and beneficial practice, and the fact of his departing from it, is presumptive against him; therefore in such a case, when the right comes to be tried in a court of law, the inquiry does not turn upon the real patent machinery that is in actual use, doing business and public good, but it is necessary often to make old-fashioned and obsolete machines that have been described in the specification, but have been superseded by better ones, and are of no use whatever except to satisfy a court of law, that what was specified will really do; and if by such evidence the court can be persuaded they will do, then, however inferior they may be to the more recent editions of the inventions (which they never examine), the patent escapes from being set aside for want of sufficient description. If the opposite parties can persuade the court that the machines described will not answer, then the patent is set aside, without any inquiry into the real merits of the invention in its modern form, and that which is in daily use, and is the subject of the action.

Is it not quite fair that the patentee should be bound to give such a specification?—Unquestionably; when an inventor's patent is set aside because he has not fully described his invention, it ought to be on the ground that the secret has been withheld, so that the public are really not in possession of it, and have consequently not derived the benefit of such possession. Instead of making ridiculous inquiries whether an obsolete specification is so defective as to destroy the patent, it should be amended by a new one, corresponding with the improved state of the practice. On the other hand, if the public are really in possession of the invention, and deriving benefit from its exercise, whether they became possessed by means of the old specification or not, the patent ought not to be set aside. It is law, that if a patent invention is insufficiently described, the patent cannot be maintained: that is, where the specification does not contain such information, that persons conversant with that art can practise the new invention with real advantage, and quite as much advantage as the patentee practised it at the time of recording the specification. That remedy for a bad specification is merely penal, and the public has no advantage from it whatever; they do not get any more complete specification by annulling the patent. If the patentee were to be compelled to bring a better specification, there would be a real advantage; and if he refused to do so, then the present penalty of forfeiture would be very properly applied.

Do you think that the public would have any security against those imperfect specifications, by the appointment of a commission to examine the specification before it was inrolled?—It would be very easy to have specifications examined and verified either by a competent commission, or by suitable referees. The courts of justice now trust to the examination and opinion of others, but they do it in an improper manner, because it is by parties, brought by interested individuals, and when it is too late to amend any defects. It is quite a branch of my business, where there are any disputes upon patents, to examine and speak to the precision or defects of the specification; where there is any doubt about it, I always have machines made in exact conformity with the drawings, and put them to the actual test. The expense of doing so is very great. A case occurred very recently of a patent invention, for which I made a specification in the year 1816, Clegg's Gas Apparatus, since called Crosley's Meter; it was just such a case as I have been describing, where the men had been working night and day to get machines to work before specifying, and only one out of two could be got to trial, consequently a specification was made describing the untried meter, in such a manner as we thought would be most likely to answer in practice when the experiment was made; but after that experiment was made, it became apparent that some things that we supposed to be the best were not the best, but as we put the whole in, the specification proved sufficient. A trial upon that patent right took place lately, in the Court of King's Bench between twelve and thirteen years after the specification had been made, and then the question was asked, why we put all those things in; in fact, they were put in necessarily, to secure ourselves against this improper hardship of the law, but with no intention of concealment or confusion. That patent was one of the very few that have been established, but it was attacked upon every ground of objection that could be made to a patent.

What should you think of the appointment of a commission authorized to examine specifications, and to certify whether they were sufficient to enable the invention to be used by the public?—I think that a specification ought not to be inrolled at all, till it is made sufficient; and that there should be no further inquiry about the sufficiency of the description, except by way of appeal against the examiners; one-tenth of the trouble and expense that is now incurred, to find out whether it is sufficient or not, when it is too late to make any remedy, would have made it sure at first.

Do you think a commission would be a proper mode of determining that sufficiency?—I think a commission well constituted would determine that and many other points very well; but I think it would be very objectionable that any previous examination should take place, as to the merit of inventions; because it is impossible to foresee which will, by future cultivation, grow up to maturity, and which will not be worth such cultivation; hence every one should be allowed a fair chance.

Would you think that such a commission should consist of certain fixed members, or that it should be appointed *pro re nata*?—I have not considered that subject enough to make up my mind; but any competent person can say whether a specification is intelligible, or whether it is not; and if it is not sufficient, the inventor should be called upon to make it sufficient; if he proves that having used reasonable diligence he has not had time to do so, more time should be allowed than was at first granted. If he makes improvements afterwards, he should be called upon to inrol them, so as to keep the record of the Patent Office a correct transcript of his operations; that is the practice in France; but there it is left to the option of the patentee; I think it should be compulsory.

How would you propose to remedy the inconveniences you have stated?—I have not formed any specific plan; but knowing the practice of France, having executed many specifications in that country, and seeing how much better their system is, I can speak from experience on the general principles that I have endeavoured to explain, without being prepared at this moment to say how far we ought to modify such a system in introducing it here; our circumstances are so different, that it would require much consideration how it should be regulated.

You complain of the inconvenience of being hurried in bringing the invention to a specification, within the time given for it, how would you propose to remedy that?—By a discretionary extension of the time allowed for specifying; always granting three months, and more than that, when a fair case is made out.

At whose discretion would you place that?—In France, discretionary extensions of time are granted by ministers, at the recommendation of those referees who generally pass the specification, if it is judged expedient to keep them secret.

Upon a representation from the applicant?—I believe so; but the extension is not for the specification; they require a complete specification in the first instance, before granting the patent in order to be transcribed in the patent itself. They also require the invention to be put in practice within two years; if the patentee fails in doing that, from reasonable causes, they allow him more time if he shows that he has used diligence, and has not succeeded for want of time. The specification is always given in at the first, and is copied into the patent itself, which is a great improvement upon our plan; I think the patent and the specification should always form one deed.

Would you compel the party to specify his invention as soon as he applies for his patent?—To specify the principles of his invention; more than that cannot be done in an efficient manner, until after it is put in practice.

How could the complete specification be inserted in the patent, if in applying for the patent he only gave in the principles of the invention?—He must have some certificate of having lodged the heads of his invention, or the outlines of the specification, that certificate being a sort of promissory note at sight, that he should have a patent given to him, upon his application, at any time within some certain period after date, the patent being given to him upon the condition of his then paying the price, and furnishing such a specification as should be approved, and which should, when made complete and approved, be inserted into the patent itself. Therefore the period which now elapses between his making the application and the inrolment of his specification, which is four or six months, would be the period which he would be allowed to make his experiments, and his specification founded thereupon; and he should have a full security against surreptitious communications of his invention in the meantime. The security against infringements should not be given, until the real patent is granted, with its meaning fully defined in itself; any previous security against infringements would be only nominal, because profitable infringements cannot take place in a new invention in so short a period. Infringements began before the date of the patent should not be inquired into, and the uniform continuance of them afterwards, should be allowed on fair terms, to be settled by arbitration, without giving the patentee any prohibitory power.

It appears that the course of application is, first, a petition to the Secretary of State, then the issue of the patent, and then the inrolling of the specification?—Yes.

The interval between the petition and the issue of the patent is uncertain?—It is; from six weeks to six months; commonly two months at an average.

The time between the issue of the patent and the enrolment of the specification is determined by the patent itself?—It is from two to eighteen months, as declared in the patent itself; commonly six months.

Then you would propose to secure to the applicant, from the time of his application, his right to the principle of his invention?—Yes, to the invention of which he details the heads; and all such fair developement of those heads as he is prepared to specify completely how to practise them, at the time when his specification is due, or with such extension of that time as is reasonable.

So that before his patent is issued, he should be required to enrol his specification?—Yes, in order that the specification may be transcribed in the patent itself, having been first approved to be sufficient, and if found deficient, or not confined within the limits of the heads first lodged, it should be amended. Whether the specification should be approved by a distinct commission, or by referees, I am not prepared to say; either way would do, if competent persons. The organization of a complete plan would require long consideration, but I feel very confident in the goodness of the principles I have suggested, having frequently considered them, but I have not set about the arrangement of any plan for carrying them into execution, because I have never seen any chance of a new plan being adopted.

By a record of the heads of an invention, could you so secure to the applicant his invention, as to leave him at sufficient liberty to pursue his invention, for the purpose of making a complete specification?—I think he ought to be bound to be able to define his principle very accurately at his first application, because he ought not to be allowed even to apply for a patent, when his invention is a mere vision; he ought not to come until he has done all that can be done mentally, by himself, and by projection on paper, so as to be fully prepared to state all the principles or heads of his invention, leaving nothing remaining to be done but what requires to be decided by experiment.

In the experiments which it would be necessary to make, in order to perfect the specification, would he not run great risk of divulging his invention, although he had entered the principal heads?—I have not sufficiently considered whether those heads should be kept secret or made public. Some public notice of the application should certainly be given; but one object of my proposition is, that if an accidental disclosure of the whole secret did take place, the inventor ought not to suffer any material injury from it. I have been told that in France an applicant may give the heads of the invention in a sealed packet, and obtain security from that date; but I am not aware of the fact, from my own practice, nor do I find it provided for in the French law.

Will you instance, in the case of Mr. Watt's improvement in the steam engine, the proposals which you suggest for the improvement of the process in obtaining a patent?—I think that the deed which Mr. Watt enrolled for his specification, ought to have been lodged at the time of making the first application for his patent; and he should have been allowed at least two years for making engines and the experiments necessary for specifying the means by which these principles should be carried into execution; within that two years he should have made such a specification as would have really instructed competent workmen how to practise the invention, whereas that knowledge never came before the public from Mr. Watt, till long after his patent was dated, and then only incidentally, not by the operation of the law.

Could Mr. Watt have made that statement of heads of invention, without previous experiments?—Yes, at the time he drew up those heads (which I say are not specific enough to be a specification,) he really had made no engine, and only a private experiment by himself, with a very incomplete model, not a working model.

Would a specification of those heads have secured him against any rivalry?—They did so in fact most completely for thirty years; his paper was most admirably well drawn, and very definite; but in allowing those heads to pass for a complete specification, a latitude was given to Mr. Watt, in favour of his great services, which the courts have never allowed in any other case, because they took it for granted, on very insufficient evidence, that they were sufficient directions to enable other persons to practise the inventions; but they are not so in fact, and upon the grounds on which courts have proceeded in all other cases, they should have annulled that patent, for want of sufficient description in the specification. It was sufficiently full and definite to enable him to maintain his patent; but those who wanted to practise the invention could not do it upon that specification. It told them plain enough what they were forbidden to do, during the term of his patent, but did not explain how they might do it, after the expiration of that term.

Then he gave in for a complete specification, that which, according to your ideas, ought to have been given in in the first instance?—Exactly so; and he never did give any complete specification such as I think ought to have been given in the second instance; the consequences of that omission have been important in his case, for long after the expiration of his patent, which was prolonged and kept in force in the whole for more than thirty years, engineers who wanted to make steam engines, had to go and steal a knowledge of his invention from his factory, or from examining engines made by him, with as much difficulty as if he had never had a patent. Going to the office and reading the specification did not answer the purpose at all. It was not till twenty years after the expiration of Mr. Watt's patent (which was fifty years after its commencement) that any number of the many manufacturers of steam engines in England, understood how to make them perform with the same perfection that they were made by Mr. Watt himself, within ten or twelve years after his patent, and as he ought to have instructed the public by a specification, as soon as he could have done so.

Can you illustrate by instances from patents that have expired, the two sorts of specification that you recommend?—Yes, I will draw up papers for the Committee for that purpose. The real specification in any invention of importance will of course be very long, and require drawings; but the heads of invention must be very concise but definite.

Was Mr. Watt's right to his patent fully protected by the law during the time he held it?—It was in fact, but I think not according to what the courts have held in other instances; they allowed his specification to be sufficient, when, in other instances they have not allowed more complete specifications to be sufficient; but his case did not pass without many arguments for and against; Mr. Holroyd was his counsel; the courts were occupied with it several times in 1795 and 1796; his law expenses were enormous, and would have been very serious to him, if he had lost the cause.

Do you consider that the term of fourteen years is sufficient in all cases?—By no means; I have stated before that fourteen years profitable exercise of any invention is sufficient; the question is, when that profitable exercise will begin, and how much previous loss and outlay is to be made up; in some instances it begins from the first; in many instances it does not take place at all during the term of fourteen years. In the case of Mr. Woolf's invention of working steam engines by high pressure steam acting expansively (either in one or in two cylinders,) there was no profitable exercise of that invention for at least ten years out of the fourteen, and there was so much loss incurred at the first, that the profit made during the last four years never repaid it.

Will you explain what means it is necessary to resort to, in order to obtain an extension of a patent in this country?—That is only done by a specific Act of Parliament, which is very difficult to obtain, and very expensive to solicit.

Are there many instances in which patents have been extended by that means?—Several; but they have never been extended, unless the inventor had the foresight to get them extended at an early period of the invention, when there was no opposition to them; Mr. Watt would have found it difficult to have obtained his extension at a late period, or without the influence of Mr. Boulton; but at the time when they applied to Parliament Mr. Watt had revealed only the heads of his invention, as they stand in what he called his specification, but the means of execution, although fully made out, remained in his own keeping; it was a strange oversight, that Parliament did not insist upon his making a real specification, when the extension was granted.

Are you aware of any applications for extensions having been refused?—Yes, several; there was one recently withdrawn a few days ago; Crosley's for a gas meter; Bramah's for his locks, was withdrawn in the same way; that was tantamount to a refusal, because the parties would not have withdrawn their bills, if there had been any prospect of success.

Would you wish a discretionary power to be vested in somebody for extending patents?—That would be a very difficult subject; those discretionary powers should be very carefully watched, or they would grow into very gross abuses very soon.

In France, it is lodged in the Chamber of Deputies, is it not?—I believe it is; the only proposition that occurs to me on the moment is, that if a proper and responsible commission should be appointed, their recommendation to Parliament, (founded on due inquiry and on their report, with evidence) might be very much attended to, so as to facilitate the obtaining such Acts of extension.

You would not think it desirable to vest that power in any other hands than those of Parliament?—I think not; if it were vested in the Crown, it would soon grow into the same abuse that existed before the Statute of James the First.

Does not the law, as to the duration of patents, operate very unequally upon different patentees?—Excessively so, almost in the inverse ratio of the merit and importance of the invention. An important invention is only a source of expense and labour to the inventor during several years, till it is brought to bear very completely; and frequently the greater part of the time expires before it is brought to bear at all. It often happens that the profit arising from the first exercise of it, after it is brought to bear, will not repay the loss and expenses which have been occasioned in its first establishment.

Can you give any instance of this oppressive operation of the law?—Many; Mr. Woolf's is a striking instance; he carried on business to a loss for at least ten years of his patent, and though he made profit in the last four years, it did not pay the loss during the first period. The extension since given to that invention is so important, that the existence of deep mining in Cornwall at this moment depends upon it. The difference in cost between the quantity of coals consumed by the engines now in use (which are all on Mr. Woolf's system,) and by an equal force of engines, such as were in use before he went into Cornwall in 1813, would absorb the profit of all the deep mining that is now carried on in Cornwall. I think Mr. Woolf is more entitled to a public reward, for the services he has rendered, without any recompence, than any inventor who has ever been rewarded by Parliament. Mr. Crosley, whose bill is just withdrawn, is another case; and Mr. Eaton, who invented the self-acting mule to put up by power. The establishment, and consequent profitable exercise of many inventions when made complete, is often retarded and prevented by public prejudice, and ignorance of their true value; also by the opposition of work-people, and the fear that they may mutiny in establishments where new inventions are first practised. I could give many instances of such cases; Mr. Eaton's is a strong one; the few machines that he made, when I prepared his specification ten years ago, have continued in profitable use ever since, but no more can be got introduced. Also Mr. Morton, for whom I made a specification in 1818, for a new slip to draw up ships, in order to repair, instead of a dry dock.

Will you state to the Committee what is the mode of proceeding by a patentee when his patent is infringed?—He must wait till he gets unquestionable evidence of the fact of infringement, which is often a very great difficulty. It facilitates the obtaining evidence to apply to the Court of Chancery; but if he has got good evidence he had much better come to a court of common law at once, without going first to Chancery. If he wants to extract the truth from the party infringing, he may possibly learn something by bill and answer.

If he has got evidence of the infringement, would not his first course be to obtain an injunction?—That is generally done to obtain evidence; if he has got evidence of the fact, the best course is to proceed at law.

Is it not an object to obtain an injunction, with a view to have an account kept of the profits?—That is the advice of most lawyers, but I never knew any practical good in it; because I never saw any real damages awarded for by-gone infringements, or those committed before a patent right had been tried and decided by a court.

May not the patentee pursue one of two courses, he may proceed either by a bill of discovery, or he may apply for an injunction?—Yes; in fact the Chancellor will grant an injunction *ex parte*, leaving it to be maintained, or removed, according to the answer of the defendant. If the answer alleges that the patent is not good, the Chancellor directs an issue at common law to try that fact, and in the meantime either removes the injunction, (leaving the parties to keep an account of the practice they make of the invention while the right is being tried;) or if it is a gross case, he sometimes continues the injunction. After obtaining a verdict that the patent is good, the Chancellor would award the damages; but it is so rare that a patent survives a trial, that I cannot tell you of any cases of satisfying damages being really paid by decree of Chancery. There is one now (the same Mr. Crosley before mentioned) who has got his patent safe through the Court of King's Bench; it is Clegg's patent for gas apparatus, which I have before mentioned, and he expects to get a great deal of damages for bygone infringement; but I doubt very much of his success, upon the ground that the condemned infringers will say it was unknown whether this patent was good or not; and therefore until that was known, they could not tell whether they might infringe it or not; hence I expect nothing but nominal damages will be given.

What is the course of defence usually made by the infringer of a patent?—The usual course (if unquestionable evidence is given of the infringement) is to contend that the patent is bad in law.

Have you known such defences frequently prevail?—They almost always prevail; it is exceedingly difficult to maintain a patent, the grounds upon which a patent may be vitiated are so numerous.

Supposing an incorrect specification has been made, what remedy have the public besides that of using the invention; have they any means of setting the patent aside?—A *scire facias* may be brought against a patentee, calling him into court to show why his patent should not be repealed, upon any ground of objection; but it is a very expensive mode of proceeding, and it puts the parties opposed to the patent in the situation of plaintiffs, which is not often the best for them, and therefore they rarely resort to it. In the other case, several different defendants may attack him in concert, by infringing the patent in every quarter, and making a common purse to carry on the war, that is a much better course for them, because if the patentee succeeds in one action, he must then try another, till his money is all gone, and he can scarcely ever keep his patent right alive to overcome them all. The few patents that have been supported have been commonly sustained by collusion with the infringers themselves, after one trial has decided that the patent is not absolutely bad, they combine with the patentee to allow them free use of the patent on moderate terms, and then, by making a common purse, they prosecute and suppress all new infringements: to effect that, they must keep up the appearance of law proceedings, but defend themselves so as to let the patentee get a verdict, which is only sham; but added to the common purse, it serves to terrify new infringers, who are not allowed to have licences or practice at all, whereby the patent right becomes a close monopoly, instead of a general practice paying a small rent to the patentee. If patent rights were made more secure in law, and by less expensive proceedings, it would not suit the interests of patentees to enter into such combinations, but, on the contrary, to promote the most extensive and open use of their inventions, under licences, at a moderate tax.

When an incorrect specification is made, the remedy of the public, is to use the invention and leave the patentee to his remedy at law?—Yes, and the remedy is the same when the patent is bad on any other ground.

Is not the remedy of getting a bad patent set aside by *scire facias*, a very expensive one?—It is.

Do you consider a more easy mode of setting aside defective patents should be adopted?—I think they need nothing more than to let them die a natural death, which they do without any process at all. There is a long process laid down in some old law books, by which the patentee may be called upon to surrender and bring his invalid patent into court, to have it cancelled, and to have the great seal torn from it; but all that is quite useless, and is never practised.

Do you think it would be right to allow patents to be supported for inventions which have become obsolete?—At present if an invention has ever been known or in use in that part of the kingdom to which the patent extends, previous to the date of the patent, slight proof of that fact will set aside the patent; the efficient revival of neglected and obsolete inventions I think ought to be encouraged as if they were new, but that would require regulation.

Can you set aside a patent on the ground that the inventor has not put his invention in practice, during the continuance of the patent?—That is the law in France, within two years, but in this country it is only inquired into by the Judges as a measure of the merit and utility of the invention; collaterally it operates, but not directly; they assume that if an invention does not come into use, there is something wrong in it, and call upon the parties to show why it is not in use. The law requires that the invention shall be publicly beneficial, and if it is not exercised, that is *prima facie* evidence that it is not publicly beneficial, and the parties are called upon to show the reasons why it was not exercised.

Is it not the law with regard to patents, that you cannot take advantage of the invention of a principle without describing how that principle is to be exercised?—It is. The patent contains a provision, that no other person shall counterfeit, imitate or resemble the invention; that is construed in the courts to mean, that they shall not take the same principle, and use other means of carrying it into effect. But if the new means used by infringers are so superior, as to supersede the original altogether, then they are commonly allowed to be used, on the ground that they must necessarily be new inventions, and not the patent one, which from its non-success, must be defective.

So that if in a specification you describe one mode of carrying the principle into practice, that patent would not cover other modes, by which the same principle might be carried into effect?—It would, if those other modes do not produce any superior effect to the original mode; but if they are so very superior, as to supersede the original, they could not be stopped by the patent. That is the manner in which I have found the courts to proceed; but it may be easily imagined, in such matters the courts will be continually deceived in the facts; and as there is no declaratory law, all inferences from precedents of this nature are very deceptive, because we cannot know upon what facts (real or assumed) the court founded their decisions.

Does not this prohibition to take out a patent for a principle, lead to a great multiplication of counts in the specification of a patent?—It does; and it is a great trouble and difficulty in preparing a specification, because it is necessary to foresee all the varieties of modes of execution that may be given to the invention, or principle, which is the essence of the patent right. It is necessary, for the security of the inventor, to describe them all, to preclude other people using them, and that the inventor may have his choice of that way which future experience will decide to be the best.

Is not there another reason for multiplying those counts, namely, to blind the public, and not to let them know upon which of the practical methods it is, that the inventor really means to depend?—I think that is rarely the intention of inventors, because when they make their specifications, they cannot know which is the best, for want of experience. They are always accused of that intention in courts, and called upon to show the contrary, but it can very rarely be so, when the specification is prepared by a professional man, who can have no motive of concealment, and who would lose his reputation if the description proved deficient; if he is deceived by a cunning inventor, he must be a very incompetent person. In Arkwright's case, it was proved in evidence that he had deluded or overruled the person he employed to draw his specification.

Would not the allowing the patent to cover the principle, provided there were one good method described of carrying the principle into effect, lead to a more precise and clear specification?—Decidedly it would; but if the patent were given for the principle exclusively, it would be pernicious to the public, that other inventors should not be permitted to work upon that principle by other methods of execution, so as to produce a better result.

You think that for a limited period, between the taking out the patent and the inrolling the specification, the right ought to cover the principle of the invention?—Unquestionably during that period, the inventor should have an entire right to all those principles of which the heads are detailed in the first paper that is lodged, and all possible applications of them, in order that the inventor may have his choice, which application he will pursue in practice, in order to specify them. Having specified, his right by patent must be contracted to what he has so specified, but leaving him full liberty to add supplements, and thereby keep his right always enlarged up to the fullest extent that he can maintain, by continuing his labours.

Supposing a man falls upon the discovery of an entirely new principle of science, such as the condensation of steam, and its application to mechanism, how would you propose to secure the advantage to the discoverer of that principle without precluding the attempt at improvement by other persons?—I do not conceive that patents are or ought to be merely a recompense to the inventor for the merit he has displayed, in what he has done previous to the grant being made; it is a sort of bargain, or a lease granted of some small portion of the public employment that is new, and has not hitherto been cultivated; that if the lessee will go to work to bring the new invention to bear, he shall have the benefit of working it for some certain time, which it is supposed will leave him a fair term, after it is brought into profitable exercise; but if the time, when properly employed, does not allow that fair term of profitable exercise, then some extension or recompense should be allowed, to cover the deficiency.

Supposing a person had discovered the principle of the condensation of steam, as applicable to first movers, and had merely given, as the mode of carrying that into effect, the form of the atmospheric engine; do you think that his patent ought to have precluded Mr. Watt, during the continuance of fourteen years, from applying for a patent for his steam-engine?—Certainly not; but at the same time it is very unjust to an inventor, that because he is superseded by some successor, he should lose all benefit from his patent; they ought to be allowed to go on together, and the profit ought to be fairly divided between them according to their previous labours, and expenses not yet recompensed, and the share each one has had in obtaining the improved result; neither ought to be stopped, the public ought to be served in all cases, and a recompense ought to be found for all those that have served the public. Such cases are not likely to occur frequently in great inventions, unless very long patent rights were established; a term even of twenty years is barely sufficient to establish one such invention, much more to see it superseded by another.

Supposing a person has discovered a principle, without inventing any method of carrying it into effect, and subsequently some method of using that principle is invented by another person; do you conceive that the person who has invented the method, should make some compensation to the person that has discovered the principle?—I think that he who has invented the method should be made to divide the advantage fairly with him who had before discovered the principle, because both parties have contributed to the public benefit; they are in the relative situation of a landholder, and the farmer who cultivates his estate,—both should participate.

How could you arrange the compensation?—It could only be arranged by arbitration.

In France, are not secret patents taken out?—In France, the specifications are always kept secret, during the term of the patent, and even afterwards, when the government decide that it is adviseable to do so. The specification has sometimes been kept secret in this country, by express Act of Parliament.

Do you know any instance of a secret patent being granted in England?—Some specifications have been kept secret by specific Acts of Parliament. In the interval between granting the patent and inrolling the specification, application is made to Parliament to suspend the operation of that clause in the patent, whereby the specification is to be inrolled in the court of Chancery, and to order that the said specification shall not be made public; Commissioners are appointed by the Act to take charge of the secret specification, to examine its sufficiency, and to answer all legal questions concerning it, without disclosing the secret.

Do you know upon what grounds the specification is kept secret?—It is commonly upon the ground that the invention shall not get away to foreigners.

What is your opinion of the policy of such a provision?—I think it is always improper, that there should be any thing like a secret specification, under any circumstances whatever.

May it not operate unjustly against individuals, who without knowing any thing of it, may be expending large sums of money in endeavouring to carry the same thing into effect? Decidedly so; and as a means of keeping our inventions from foreigners, it is the highest premium that can be offered to an inventor, to go or send it abroad himself, because he will have no competition in the foreign country, and can obtain a patent there; it also offers a high premium to all the workmen to go abroad, who first get a knowledge of the invention (and who in that character, are for a time very important to both nations which shall get their services, whereas if foreigners can get intelligibly written specification from the offices, for a small sum of money, they prefer setting their own men to work on such instructions, to the expense of taking our workmen away; or they do not begin at first, to seduce our workmen; and after a time when they do begin, we have got several instructed, so that the loss of a few is not felt. I know practically, the evils which have been experienced from useful workmen being enticed abroad, in order, by their means, to steal secret inventions, of which they possessed an exclusive knowledge: the best remedy for it, was to take out a patent in France, and I was sent there to solicit the patent, and thus prevent their exercising the invention there, after they had stolen it. That French patent has one of the most complete specifications I ever made; it is in the French language, and is now deposited in Paris; but no specification of the same invention exists in England, or in English. After that French patent was so obtained, a very considerable manufactory was established under it there by Englishmen; but the origin of the measure was to prevent seduction of workmen, which would never have happened, (or at a later period when it would have been of no consequence,) if foreigners could have got a specification freely from our patent offices, they would have set their own men to work on it by preference.

Does not the claim of originality, with respect to a single minor point which is not original, vitiate the whole patent?—It does.

Do you not think that that is very impolitic?—It is a most excessive hardship and injustice, and every way impolitic; the reason for it is, that so long as patents are granted merely upon the request of the inventors, and whilst they are left at liberty to specify what they please, if there were not some limiting penalty of that sort, they would put inventions *ad infinitum* into their specifications, for the chance, that if one hook did not catch, another might.

Do not you think that the proper course would be to set aside that part which is not original?—Decidedly, that is justice; and yet it should not be allowed to the inventors to put an unlimited number of inventions into their specifications; but the practice of leaving them to their own discretion, under the penalty of setting aside their whole patent, because they have exceeded just bounds (which bounds are not defined) is both unjust and impolitic,

(*To be continued.*)

Novel Invention.

Braithwaite and Ericsson Fire extinguishing Steam-Engine.

THERE are occasionally projects in mechanical science which, though founded upon correct principles, appear at first sight impracticable, because at variance with some preconceived notions which we have long entertained. Under this description of inventions may be ranked the fire extinguishing engine of Messrs. Braithwaite and Ericsson. For the very idea of lighting a furnace, and getting up the steam to high pressure for working an engine on the first discovery of an accidental conflagation, seems to involve such an expense of time and labour as to induce a conviction of its absurdity from the reasonable probability that the flames would have destroyed a considerable mass of property before the means of extinguishing them could be brought into action, yet such is the ingenious construction of this engine, and the facilities which it afford, of being quickly brought into operation on any emergency, that we really consider it an important acquisition to our previously existing means of protection, and feel persuaded that a dispassionate considerations of its capabilities and powers will obtain for it that extensive public approval which it unquestionably merits.

Plate IX. is a longitudinal elevation of the engine, which is one of high pressure, intended to exert the power of six horses. It consists of two cylinders placed horizontally, the one being the steam cylinder of seven inches in diameter; the other, the water pump, of six and a half inches in diameter, with a stroke of sixteen inches. The steam and water pistons are connected by being affixed to one rod, and consequently receive a simultaneous action, by the rod working through stuffing boxes at the end of each cylinder; which rod, by its horizontal action, forms its own parallel motion, the stuffing boxes serving as guides.

The principal feature of novelty in this engine, and the one by which its extraordinary powers have been so successfully developed is the boiler, for which Messrs. Braithwaite and Ericsson have obtained a patent, (see vol. iv. p. 188, Second Series of our Journal) which is constructed on the same principle as the boiler of the "Novelty" Locomotive Engine, exhibited on the Liverpool and Manchester Railway in the autumn of last year. By the use of this boiler a very rapid generation of steam is obtained—a considerable saving in the expense and consumption to fuel is effected; and the weight and size of the carriage much less than could have been made by any other construction of boiler. An apparatus is attached, for the purpose of forcing the heated air through the flues of the furnace, and for creating a very rapid and effectual combustion. The other parts of the machine consist of the necessary water and mercurial guages for safety, and for the regulation of the operative parts of the engine; force pump for supplying the boiler with water, safety valves, &c. &c.

Having now described generally the mechanical arrangement of the engine, we proceed to detail more minutely its various operative parts; *a,* is a frame of wood mounted on springs, to which are attached the running wheels, (which are made of iron on Mr. Theodore Jones's patent principle) this frame supports an inner one of iron, carrying the cylinders and the principal working parts of the engine. At one end of the frame will be seen the steam chamber *b,* on the top of which is the safety valve *c,* and a box or hopper *d,* for supplying the furnace *e,* with fuel: from the upper part of the furnace flues are carried in a horizontal direction, occupying the inner part of the boiler *f,* through which flues the heated air is forced at a very rapid rate, and after imparting its caloric to the water in the boiler, escapes through the bent pipe or chimney *g.*

Steam is admitted into the cylinder *h,* by turning the cock in the pipe *i,* through the passage *j,* the slide in which is actuated by a cross head fixed on the piston rod *k,* giving motion to a lever *l,* which lever also works the force pump *m,* and blowing apparatus concealed in the boot of the diving box *n.* On the axle of the hinder wheel, which is an excentric *o,* which, as the engine is proceeding to a fire, gives motion to a lever connnected with the blowing apparatus by which steam is generated previous to the engine being put in operation: this apparatus can be worked by hand if necessary, and be detached in an instant from the operative parts of the engine; *p,* is a double action water-pump, the bucket of which is attached to one end of the piston rod *k;* there are two suction pipes, one of which is seen at *q,* through which the water passes to the pump, where it is forced into the air vessel *r,* through the passages *s,* and discharged through the nozzle *t,* to which the hose and fire and pipe is attached. This engine has only two nozzles, but any number proportionate to the power of the engine may be provided, thereby doing the work of a corresponding number of engines on the ordinary construction; *u*, is a pipe for carrying off the waste steam from the cylinder *h*, and *v*, is the box for containing the fuel, &c. which also serves as a seat for the assistant engineer attending the furnace; *w*, is the mercurial gauge, &c. We next proceed to describe the operation of the engine, which is as follows:—On the alarm of a fire being given, while the horses are being attached, the engineer supplies the boiler with the necessary quantity of water by the force pump *m*, which, as will be seen, is provided with a hand lever for the purpose; this done, he feeds the furnace through the hopper *d*, and should the horses not be ready, proceeds to work the air forcing apparatus, with the lever beforementioned; immediately on the engine starting, the excentric and its lever works this apparatus, and most probably before the engine arrives at its destination, the steam is got up to the pressure necessary to put it in full operation, for that object is generally accomplished in the space of eighteen minutes, the management of the engine being so very simple, any person at all acquainted with the nature of a steam engine will at once perceive that it requires but one engineer to attend to the steam cocks, &c. and an assistant to give his attention to the furnace, force pump, &c.: in fact, on one or two late occasions it has been successfully worked by one hand only.

The effect produced by this engine has been fully demonstrated by various experiments which have been made with it, and is as follows:—through a branch pipe, with an opening of seven eighths of an inch in diameter, 9,000 gallons of water (about forty tons) were delivered per hour to an elevation of ninety feet: through two jets, with an opening of three fourths of an inch in diameter, fifty tons per hour were thrown to an elevation of fifty or sixty feet; and, on a calm day, with a seven-eighth's aperture, the water has been thrown as high even as 140 feet, which is sufficient to reach the top of the highest buildings; but might be much further extended by the use of an engine of greater power than the present.

Before closing our notice of this ingenious piece of mechanism, we cannot help offering a few remarks on the utility of such an engine, not only as regards the metropolis, but also the principal commercial and manufacturing towns throughout the kingdom, where much valuable property is frequently destroyed, as well from the inadequacy of the supply of the water, as from the insufficiency of the power applied to engines constructed on the ordinary principle: this has been particularly evident, where the fire has originated at the top of a high building, such as the warehouses of our docks, and the immense factories of Manchester, Leeds, &c. At the same time, we think that the inventors are deserving of the public patronage for the ingenuity which has been displayed in the arrangement of the various parts of the apparatus, and for the spirited manner with which they have come forward on many late occasions to give their voluntary assistance in endeavouring to save the lives and property of their fellow-creatures. We understand that the Dock Company of Liverpool, aware of the inability of the present engines to extinguish fires at the upper or even middle part of their high warehouses, and with a laudable zeal for the encouragement of British ingenuity and industry, have given the inventors an order for one of a much greater power, viz. fifteen horses, which will throw up at an immense height, a quantity of water almost incredible, and we hope that the other leading towns of this kingdom will not be long in following their example.

New Patents Sealed, 1830.

To Matthew Bush, of Dalnonarch Print Field, near Bonhill by Dunbarton, North Britain, calico printer, for his having invented certain improvements in machinery, or apparatus for printing calicoes and other fabrics.—Sealed 24th May, 6 months.

To John Holmes Bass, of Hatton Garden, in the county of Middlesex, Gentleman, for his having invented certain improvements in machinery for cutting corks and bungs.—3d June, 6 months.

To John Levers, of New Radford Works, near the town of Nottingham, in the county of Nottingham, lace machine maker, for his having invented or found out certain improvements in machinery for making lace, commonly called bobbin net.—8th June, 6 months.

To George Vaughan Palmer, of the parish of Saint Peter, in the city of Worcester, artist, for his having invented a machine to cut and excavate earth.—8th June, 6 months.

To William Tutin Haycraft, of the Circus, Greenwich, doctor of medicine, for his having invented or found out certain improvements in steam engines.—11th June, 6 months.

To Thomas Brunton, of the Commercial Road, Limehouse, in the county of Middlesex, merchant, and Thomas John Fuller, of the same place, civil engineer, for their having found out and invented an improved mechanical power, applicable to machinery of different descriptions.—19th June, 6 months.

CELESTIAL PHENOMENA, FOR JULY, 1830.

D.	H.	M.	S.	
1	0	0	0	☉ in Ephelio.
1	0	0	0	Clock before the ☉ 3 *m* 21 Sec.
1	14	0	0	☽ in conj. with γ in Libra.
2	16	0	0	☽ in conj. with φ in Oph.
4	12	0	0	☿ in conj. with ζ in Taurus
5	0	0	0	Clock before the ☉ 4 *m* 5 Sec.
5	14	24	0	Ecliptic opposition or ○ full moon.
5	19	0	0	☾ in conj. with *d* in Sagett
7	23	0	0	♃ in conj. with *o* in Sagett
8	4	0	0	☿ in conj. with ξ in Taurus.
9	18	0	0	☾ in conj. with λ in Aquarius.
10	0	0	0	Clock before the ☉ 4 *m* 53 Sec.
10	4	0	0	☾ in conj. with φ in Aquarius.
12	15	36	0	☾ in ▭ or last quarter.
13	11	0	0	☿ in conj. with η in Gemini
14	1	0	0	☾ in conj. with 2 in Ceti.
14	19	0	0	☿ in conj. with 1 μ in Gemini
14	20	0	0	☾ in conj. with f in Taurus.
15	0	0	0	Clock before the ☉ 5 *m* 31 Sec.
15	6	0	0	♀ in conj. with ι in Taurus
15	17	0	0	☾ in conj. with γ in Taurus
15	18	0	0	☾ in conj. with 1 δ in Taurus
15	18	0	0	☾ in conj. with 2 δ in Taurus
15	23	0	0	☾ in conj. with α in Taurus
15	20	31	0	☾ in conj. with α in Leo. An occultation, Immersion 20 h. 50 m. Emersion 16 d. 0 h. 37 m.
19	12	14	0	Ecliptic conjunction or ● new moon.
20	0	0	0	Clock before the ☉ 5 *m* 57 Sec.
22	7	0	0	♀ in conj. with ζ in Taurus
22	9	0	0	☽ in conj. with ζ in Leo.
22	17	0	0	☿ in conj. with δ in Gemini
22	22	38	0	☉ enters Leo.
24	1	0	0	☽ in conj. with β in Virgo.
24	16	0	0	☽ in conj. with π in Virgo.
25	0	0	0	Clock before the ☉ 6 *m* 9 Sec.
25	4	0	0	☽ in conj. with 1 γ in Virgo
27	4	0	0	in conj. with π in Virgo
27	8	36	0	☽ in ▭ first quarter.
27	12	0	0	♃ in conj. with 1 ν in Sagett
28	22	0	0	☽ in conj. with γ in Libra
29	9	0	0	☽ in conj. with ψ in Libra
29	14	0	0	♀ in conj. with π in Gemini
30	0	0	0	Clock before the ☉ 6 *m* 6 Sec.
30	1	0	0	☽ in conj. with φ in Oph.
31	4	0	0	♀ in conj. with μ in Gemini

The waxing moon ☽.—the waning moon ☾

Rotherhithe. J. LEWTHWAITE.

METEOROLOGICAL JOURNAL, FOR MAY AND JUNE, 1830.

1830.	Therm		Barometer.		Rain in inches.
	Hig.	Low	High.	Low.	
MAY					
26	59	47	29,42	Stat.	,375
27	58	45	29,56	29,46	,15
28	58	45	29,96	29,75	
29	63	40	30,02	29,94	
30	58	41	29,76	29,72	,3
31	65	41	29,91	29,80	,4
JUNE					
1	66	50	29,98	29,96	,05
2	69	39	30,06	30,00	
3	64	46	29,79	29,56	
4	58	47	29,83	29,49	,9
5	65	41	29,95	29,92	
6	67	44	29,93	Stat.	
7	61	49	29,86	29,84	,025
8	60	46	29,98	29,94	,175
9	57	46	29,99	Stat.	,025
10	56	46	29,95	Stat.	,025
11	65	45	29,93	29,90	
12	65	44	29,72	Stat.	,125
13	58	40	29,76	29,72	
14	60	40	29,66	29,56	,05
15	57	43	29,69	29,56	,575
16	60	45	29,79	29,56	,15
17	55	43	29,86	29,83	,075
18	66	41	29,74	29,60	
19	61	43	29,60	29,53	,125
20	64	43	29,58	29,55	,05
21	66	41	29,52	29,45	
22	58	44	29,60	29,39	,15
23	62	36	29,82	29,76	
24	68	45	29,85	29,83	
25	70	52	29,74	29,68	,25

EDMONTON. CHARLES H. ADAMS.

THE

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No. XXIX.

[SECOND SERIES.]

Recent Patents.

To **William Church,** *of Birmingham, in the county of Warwick, Gentleman, for his having invented certain improvements in Buttons, and in the machinery or apparatus for manufacturing the same.*—[Sealed 26th March, 1829.]

The subject of this patent for making buttons is an improvement upon a former invention communicated by the present Patentee to Thomas Tyndall, gentleman (see Vol. III. of our present Series, page 126.) In the former instance it was proposed to manufacture a peculiar kind of button, resembling the ordinary silk buttons used on men's coats; which object was effected by the rotation of a shaft, that actuated all the parts of the mechanism for collecting and combining the materials, and discharged the button in a finished state.

Highly ingenious as this apparatus must have appeared to every inspector, yet there were parts possessing considerable complication, which rendered the performance of the machine less complete, and more easily deranged than was consistent with its certain and effective operation. To remedy these defects, to improve the articles produced, and to simplify the mechanism, has been the object of the inventor, and these he has accomplished with great ingenuity in the machine we are about to introduce to our readers, in which the general construction is nearly the same as in the former, but the details of the mechanism, and their mode of acting are considerably different. The following is the

SPECIFICATION.

" My improvements in buttons, and in the machinery or apparatus for manufacturing the same, consists in certain variations from, and additions to, a contrivance and apparatus for making buttons, for which (in consequence of a communication made by me when residing abroad,) a patent was granted to Thomas Tyndall, of Birmingham, Esquire, dated the 4th day of December, 1827, a specification of which was duly inrolled in the office of the Rolls Chapel, and to that specification I refer, as exhibiting the principles on which I manufacture buttons. My present improvements on the former machine consist of the following particulars; viz. 1st, in the mechanism and method by which the shells or foundations of the buttons are prepared; 2nd, in a mode of making a new kind of shank for the backs of buttons; that is, the machinery or apparatus for forming the said shanks; 3dly, the contrivancce by which the florentine, or other material for covering the face of the button is conducted into the machine; 4thly, the apparatus for gathering in the edges of the florentine over the shell previously to attaching the shank piece; and, 5thly, the mode by which the wheels are driven, that carry the several parts of the button, for forming it and putting it together; the particulars of which said improvements, are fully set out in the drawings hereto annexed, and will be clearly understood by the following description thereof: the similar letters of reference pointing out corresponding parts in all the figures.

Plate X. Fig. 1, is a front view of the complete machine for making buttons with the present improvements attached, fig. 2, is an end view of the same, taken at the left hand of fig. 1. The power by which the machinery is to be driven, must be applied to the horizontal shaft A, A, which may be by hand or by a rigger and band from a steam engine, or other first mover, and governed by a fly-wheel.—Upon the said shaft, a bevel wheel B, is fixed, taking into a similar wheel C, at the lower end of the short vertical shaft D, having a crank E, at its upper extremity. From this shaft D, arises the impelling power, which actuates the carriages that feed in the materials of which the button is to be constituted.

" On the top of a sliding standard, F, is mounted a pair of spring claws G, which are intended to hold the sheet of thin metal, that the shells or foundations of the buttons are to be made from; by the action of cutting discs in the manner hereafter described. Another sliding standard H, carries a similar pair of claws I, holding the sheet of metal, out of which the other discs are to be cut for forming the shank pieces, that is, the back part of the button and its shank. At the opposite side or back of the machine represented in fig. 3, the roller K, is placed carrying the florentine or other material, for covering the faces of the buttons. This roller is suspended on pivots bearing in the sliding frame L, L.

" A representation of the parts of the mechanism laying on the table of the machine, is shewn in the plan or horizontal view, at fig. 4, which will explain the movements of the several racks, pinions, and catches, connected with the feeding apparatus, above alluded to.

" The rotation of the crank E, causes the lever O, (see fig. 4) to vibrate, which moves the catch P, to and fro, and this catch taking into a rack Q, affixed to the sliding frame or carriage L, at every stroke of the lever, moves the rack Q, and also the sliding frame L, the distance of one tooth. The sliding of this frame, causes the rack R, affixed to it, to drive a pinion, S; at the back end of the shaft T, which shaft (though represented broken in fig. 4,) crosses the table of the machine, and has two other pinions attached to its opposite extremity, severally taking into the racks V, and U, fixed to the sliding plates, to which the standards F, and H, with the feeding apparatus, are attached.

" Thus it will be perceived that the rotation of the crank E, through the intervention of the lever O, and pall P, moves the sliding bar L, for feeding in the florentine, and this sliding bar by its rack R, drives the pinion and shaft S, T, which by means of the pinions and racks V, U, moves the feeding apparatus for supplying the two sheets of metal, out of which the shells, and also the shank pieces of the buttons are to be made.

" Let it now be supposed that the sheet of metal for forming the shells is held in the claws G, and passed through the slit of the punch box W, where the disc is to be cut out. In a similar way the other sheet of metal for making the shanks is held in the claws I, and passed through the slit in the punch box x, for the same purpose.

"The constructions of the cutters, for punching out the discs for the shells and for the shank pieces being similar, though slightly different in size, are shewn in section, in the detached figure 5; *a*, is a pin passed through the lever *b*, and through the standard *c*, fixed on the plate *d*, seen in fig. 2.

"To one end of the lever *b*, is attached the rod *e*, which rod extends downwards, and is connected at bottom to the tappet lever *f*, hanging in the staple *g*. This lever *f*, is acted upon by the cam wheel *h*, on the main shaft A; hence, as the cam *h*, goes round, the tappet lever *f*, is raised, which lifts the rod *e*, and the tail of the lever *b*, and thereby depresses the punch at the reverse end of the lever, by which means the disc of metal is cut out of the plate.

"The particular construction of this punch is shown by the sectional figure 5; *w*, is the punch box before mentioned, in which there is a slit for admitting the sheet of metal edgeways. The cutting punch *i*, is a cylindrical tube of steel, which being depressed by the action of the lever *b*, in the manner above described, punches or cuts out against the lower cutter *j*, a disc from the metal sheet; which disc by the cutter is forced down into the recess of *j*. There is a plunger *k*, acting within the cutting tube *i*, which is connected to a lever *l*, mounted on an axle in the standard *c*; the reverse end of this lever *l*, is attached to a rod *m*, passing down within the rod *e*, to the cam *h*, where a tappet lever, similar to *f*, and working within it, is acted upon by the cam directly after the disc has been cut, and causes the punch to push the disc through the recess *k*, or drawing block *j*, and turn up the edges, (technically called drawing through) and deposit the shell thus formed in one of the recesses of the carrying wheel *n*

" The discs for the shank pieces, which are not quite so large as those for the shells, are cut and drawn through by similar means to those last described. The punch box for cutting the shank pieces, is shewn at *o*, in figs. 1 and 2, and *p*, is the hollow rod, carrying the cutter with the plunger within, which are actuated by the tappet levers *q*, worked by a corresponding cam wheel on the main shaft. These discs are also deposited in one of the carrier wheels *r*, ready to be conducted through the machine, for the further manipulation of the button, as described in the former specification.

" Fig. 6, represents the system of carrier wheels, as seen horizontally detached from the other parts of the machine, of which there are two more than in the former invention, *n*, and *r*, designed as above said, for receiving and conducting the shells and shank pieces. These carrier wheels are mounted on a vertical shaft, and driven by toothed gear below.

" In my present method of forming the shank of the button, the shank piece is conveyed to the several punches by the carrying wheels, as in the former specification.—Suppposing the shank piece to be deposited in the carrier wheel *r*, at the hole No. 1, after three movements of the machine, it will arrive at the situation of No. 4, which is immediately under a hole in the wheel *s*; at this time the first pair of dies come into operation, for piercing and raising a cross, which is to form the shank. Representations of these dies are shewn in several figures, partly in section, (one quarter size in the plate.)

" Fig. 6, shews the first pair of dies, by which the piece of metal is pierced in the form of a cross, and raised spherically. When the shank piece has proceeded on to the next stage, No. 5, a pair of nippers are applied for the purpose of rounding the edges of one of the bars of the cross or shank. These nippers are connected to one of the descending punches, and are shewn detached at fig. 7. The nippers a, a, are held within the hollow punch, their chaps being kept open by a spring, until they have embraced the cross b, and a wedge piece above them acting between the tails of the nippers, causes them to close and pinch the bar of the shank into a round or wire like form. The wedge piece is depressed by jointed levers, c, d, as seen in fig. 8, and are connected to the perpendicular rod *w*, as shewn in fig. 3, which rod is acted upon by the rotatory cam *x*, on the main shaft. The next movement of the machine brings the shank piece to the situation, No. 6, where a similar pair of nippers, actuated by the same levers and rod pinch up the other bar of the cross shank and the finishing touch is given to the shank at the hole No. 7, where the dies fig. 8, are brought into action by the means above stated.

" The mode of working the punches in my present machine, is very similar to that described in the former specification above referred to, that is the upper series of punches are fixed to the upper moveable block Y, Y, and the lower series of punches to the lower moveable block Z, Z, which are slidden up and down, by the side rods connected to the cranks on the main rotatory axle A, A, by means of which movements, the corresponding punches and dies, sliding through the guide plates, are brought together for the purpose of giving the required impression in forming and putting together the several parts of the button.

" The discs of florentine, or other materials for covering the faces of the buttons, are cut out of the piece simultaneously with the metallic discs, but at the opposite side or back of the machine. The florentine, as before stated, is rolled upon the roller K, and is passed between the drawing rollers into the slit of the punch box *y*, where the cutter, constructed as described in the former specification, is brought down, and made to cut out the disc of florentine, through the agency of the levers and rods *z*, *z*, *z*, *z*, at the lower extremity of which is a tappet lever, acted upon by a cam wheel in the centre of the main shaft.

"It will now be necessary to refer to the former part of this specification, in which the lateral movements of the standards of the feeding apparatus F, H, and L, L, are described as being effected by the rotation of the pinions, severally taking into the racks V, U, and R, and it will be seen that the sheets of metal for forming the shells and the shanks of the buttons, and also the florentine for covering them, are by those means progressively slidden along through their respective punch boxes, and the discs cut therefrom for the purposes and in the way above described.

"Let it be supposed that a series of discs have been cut from the end of each of the sheets of metal, and from the piece of florentine, in straight rows, it now becomes necessary to advance the sheets and pieces forwardand to traverse them back again, laterally in order to cut another row of discs from each, the contrivance for which is shewn in figs 3, and 4.

"When the rack Q, has slidden to nearly the end of its range, a tappet, fixed to the rack, comes against an enclined plane on the side of the piece f, and pushes it into the situation shewn by dots, the object of this movement is, that at the next revolution of the crank E, the end of the lever O*. at g, may strike against the end of the piece f, and cause it to throw the three armed lever h, into the situation shewn by dots. This movement of the lever h, allows the spring catch i, to fall into the teeth of the rack Q, and at the same time withdraws the spring catch P, from the rack. The rotation of the crank E, in actuating the levers, now causes the rack Q, and also the carriage with the florentine, to traverse back again; but simultaneously with the last charge, the tappet e, strikes against an enclined plane on the catch rod k, and presses it back, as shewn by dots, so that as the lever o, vibrates, a pin at its end now takes hold of the hook of k, and draws the catch rod along, which moves the lever and click (1), and causes the ratchet wheel m, to be driven forward one tooth.

" At the upper extremity of the perpendicular shafts n, to which the ratchet wheel m, is affixed. There is a broad wheel taking into a similar wheel o, on the horizontal shaft (p), extending along the back of the florentine carriage. This wheel o, is confined by a bracket, and allows the shaft p, to slide through it from end to end, being locked together by a feather key.

" The occasional movements of the shafts n, and p, are communicated by means of toothed gear q, to the feeding rollers, r, (see fig. 3), by which means the edge of the florentine is advanced after cutting each range.

In order to set up or advance the sheets of metal after cutting each range of discs for the shells and shank pieces, a toothed wheel s, is placed in the middle of the upper feeding roller, which takes into a toothed wheel sliding on the shaft t. This shaft is therefore driven simultaneously with those employed in feeding the florentine, and their being two pinions of different diameters fixed to this shaft, taking into racks v, v, and u, u, which racks are connected to the feeding apparatus by being attached to the carriages of the claws G and I, the sheets of metal are consequently drawn in when required.

"The train of toothed gear which drives the carriers is actuated by a crank wheel, w, on the shaft D, see fig. 1. This wheel takes into a peculiarly formed star wheel, x, which is shewn in two positions, upon an enlarged scale at figs. 8 and 9.

"By reference to the former specification, the mode of gathering in the edges of the florentine over the shell of the button will be perceived. I now perform that object in the manner shewn in figs. 10 and 11. The apparatus consists of two very thin plates of steel, sliding upon each other. They are mounted in brass frames, and placed between the two central carrier wheels, as shewn at y, y, in fig. 5. A peculiarly formed hole is made in each plate, the ends of each hole being circular, but of different diameters, so that when the plates are slidden in one direction, a circular aperture of about an inch is formed, and when they are slidden in the opposite direction, the aperture is contracted. This movement is effected by the crank levers z, z, acted upon by one cam wheel on the main shaft. Previous to these gatherers coming into action, the shell and with it, the disc of florentine beneath, is driven into one of the holes of the lower carrier wheel, as described in the former specification, by which the edges of the florentine are thrown up, round the shell, and being thus inclosed within the wheel, they are conveyed under the aperture of the gatherers, where, by the next operation of the lower punch they are raised up, and the edges of the florentine brought through the gatherers, which are then drawn so as to contract the hole and bring the edges of the florentine into a small compass. At this time the punch with the shank piece descends upon the gatherers, and the aperture of the gatherers now opening, allows the shank to be pressed into the hollow shell, carrying the edges of the florentine in with it, which becomes sound and firmly fixed by the last operation of the punch."—*Inrolled in the Roll's Chapel office, September*, 1829.

Specification drawn by Mr. Newton.

To JOSHUA BATES, *of Bishopsgate-street Within, in the City of London, Merchant, in consequence of a communication made to him by a certain Foreigner residing abroad, being in the possession of a new process or method of whitening Sugars.*—[Sealed 1st August, 1829.]

THE process of whitening sugars, specified under this patent, is a method of applying clear water so as to percolate through sugars, when either in a crystal state in the conical pots, after boiling, &c. or in the raw state, for the purpose of removing the colouring matter which is contained between the particles and crystals of the sugars, and is intended to be used instead of the usual method of claying, which is well known to possess many disadvantages. After describing the usual method of claying sugars, in order that the purport of his invention may be perfectly understood, the Patentee states that instead of using the 'batter' of pipe clay and water, as in common he uses, pans made of unglazed earthenware, and of a porous nature, (of the kind wine coolers are usually made), which pans are filled with clear water, and are placed upon the sugar in the conical mould pots, the water being allowed to percolate through the interstaces of these pans, and through the sugar, for the purpose of removing the colouring matter in a more even and regular manner than from the pipe-clay as in common; the pans are to be made of the same shape as the base or largest part of the conical pots, and may be made so as to nearly fill them, but this is not necessary, as a half inch space may be left between the outside of the pan and the inside of the conical pot. In Plate XI, fig. 12, is a plan view, and fig. 13, a section of that shaped pan, which the patentee recommends, that is with the sides a little inclining inwards, as it may be more readily moved from place to place, but the pans may be made with the sides perpendicular, as in figs. 14 & 15; then the patentee recommends that they should have two handles projecting upwards, as shewn in the figure. The advantages which this method possesses over the common mode of claying are, that the workman can continue the process of whitening until completed, without being obliged to move the pans, and consequently save the time taken up in removing the various layers of clay batter, and that the supply of water is more regular than from the clay, which, when first put on, gives out much more water than after it has been draining some time; and also that the sugar is not liable to be injured by the clay getting among it, or receiving a disagreeable taste or odour, which it is apt to get from clay which has been used several times. For whitening raw sugars in the conical shaped pots in common use, the patentee states that there is a great difficulty in getting the water to percolate through the sugar in an even and regular manner, as the water will make its way through it where least resistance is offered, and consequently the process is very imperfect, to obviate which the patentee uses shallow pots, which are divided into several conical compartments, each having its own drip hole. One shaped pot, the bottom part of which is divided into seven compartments, each having a drip hole, is shewn in section, in fig. 16, and a plan view, looking in the mouth in fig. 17. Fig. 18, is a section of another pot, the hollow of which is divided into a greater number of small compartments, each having its own drip hole; by the use of these shaped pots the patentee states that he is enabled to get rid of the colouring matter more readily, and with less injury to the grain or crystals of the sugar. The patentee of course intends to use the pans containing the clear water before described; and he also states that the flow of water through the pores of the pans can be increased or retarded by having pans made of more or less porous material, or by putting sand or other materials into the bottom of the pans with the water, and thus retard its escape through the pan, and also that the conical mould pots may be quite filled with sugar, as it is not necessary to leave the space unoccupied which is taken up by the layer of clay and water in the common process of claying."—[*Inrolled in the Inrolment Office, February,* 1830.]

To **William Prior,** *of Albany Road, Camberwell, in the county of Surrey, Gentleman, for his having invented or discovered certain improvements in the construction and combination of Machinery, for securing, supporting, and striking the top-masts and top-gallant-masts of Ships and other vessels.*—[Sealed 11th April, 1829.]

SPECIFICATION.

"My improvements in the construction and combination of machinery for securing, supporting, and striking the top-masts and top-gallant-masts of ships and other vessels, consists in the novel construction of an apparatus to be employed in place of the fid, usually applied to that purpose, which apparatus contains either a sliding or a swinging bolt, worked by a cam or excentric roller. The two kinds of bolt with the rotatory cam are shewn in the several figures in Plate XI.

Fig. 1, represents the parts in operation; *a*, is the top-mast, shewn partly in section, which is supported by the two sliding bolts, *b b*. The bolts slide in sockets or carriages, resting upon the tressels *c*, *c*, and their points being projected forward into recesses in the sides of the mast, as shewn in this figure, support it as long as the bolts are prevented from sliding back, but when the bolts are allowed to recede, as in figure 2, then the mast loses its support, and slides down between the tressels. The particular feature of novelty in this invention is the contrivance whereby the bolt is retained in its place, which is by means of a cam or executric roller, *d*. Part of the roller is made cylindrical, and concentric with its axle, which fits into a segment-formed recess at the back part of the bolt, and while the concentric part of the roller bears against the recess, the bolt is prevented from receding, and consequently the mast is supported as in fig. 1. On turning the roller *d*, round by a hand spike, as *e*, or by a winch to be applied to its axle, or by any other suitable contrivance, the executric part of the roller is brought against the recess behind the bolt, as at fig. 2, and the resistance being thus removed, the weight of the mast bearing upon the points of the bolts, causes them to slide back, and allow the mast to descend as in the act of striking.

" Fig. 3, shows a horizontal representation of the cross trees and tressels, with the top-mast, *a*, cut across in section at the aperture where the points of the bolts enter; the bolts *b*, *b*, being projected forward as in figure 1. Figure 4, is a similar representation of the cross trees and tressels, the bolts being withdrawn, and the mast sliding down as in figure 2. In order to guide the bolts with certainty, a groove is cut in the upper part of each bolt, as shewn by dots in figures 1 and 2, for the purpose of receiving a concentric rib, carried round the excentric part of the cam, but I deem this rib and groove of little importance.

"My other contrivance, consisting of swinging bolts, is shewn in the drawings at figs. 5, 6, 7, and 8. In fig. 5, as in fig. 1, *a*, is the top-mast, *b*, *b*, the bolts, swinging on pivots or axles, mounted in carriages, supported on the tressels, *c*, *c*. The excentric rollers, *d*, *d*, act against segment recesses at the backs of the swinging bolts, *b*, which confine them, and cause their points to support the mast, as in fig. 5. On turning the cam rollers round by a hand spike or other contrivance, the excentric part of the cam comes against the bolt, thereby releases it, when the weight of the mast bearing on the points of the bolts, causes them to descend, and the mast slides down as in fig. 6. The two horizontal views, figs. 7 and 8, represent the swinging bolt in the two positions, similar to the sliding bolt in figs. 3 and 4.

"Having described the construction of my improved apparatus for securing, supporting, and striking the top-masts and top-gallant-masts of ships, &c. I wish it to be understood that the particular feature of this invention, and that which I exclusively claim under the above recited Letters Patent, is the cam or excentric roller for holding or releasing the bolt, whether the same be applied to a sliding or a swinging bolt."—[*Inrolled in the Rolls Chapel Office, October*, 1829.]

Specification drawn by Mr. Newton.

To Samuel Brooking, Esq. *of Plymouth, in the County of Devon, a Rear Admiral in our Royal Navy, for his having invented a certain turning or slipping Fid, for securing and releasing the upper Masts of Ships and Vessels.*—[Sealed 6th May, 1828.]

The slipping or turning fid, described by the Patentee, in his specification of this patent is, a rod or bar of iron, or other metal, or hard wood, placed immediately over the central cross tree, and is made to turn in bearings, which are bolted upon the two tressel trees, having a flat surface for a part of the heel of the top mast to rest upon; the other part being cylindrical. The heel of the top mast is formed with a notch, or projecting piece which rests upon the fid, when the top mast is up. The mast being kept in its place by palls or wedges, or by lashing, or otherwise fastening it to the top of the lower mast; and when released to be struck, the notch or projecting piece is allowed to fall or slide off the fid, as it is turned round; the flat surface presenting an enclined plane to the projecting piece, there being sufficient space between the central and the foremost cross tree, to allow of its descending.

Plate XI, fig. 9, is a vertical section taken through the ends of the masts, cross trees, &c., when the top-mast is up. Fig. 10, is a similar section, taken in the act of striking the top-mast, and fig. 11, is a plan of the cross trees, and tressel trees, shewing the situation of the fid. The same letters referring to similar parts in these three figures, *a*, is the main mast, *b*, the top mast, *c, c*, the two tressel-trees *d*, the central cross tree, *e*, the foremost crosstree, and *f*, the fid, turning in the bearings *g, g*, on the central crosstree. When the topmast is up, as shewn in fig. 9, it will be seen that the flat part of the fid, is under the notch or projecting part (*h*) in the heel of the topmast, and will support the mast while kept in this position by the palls *i*, *i*, which turn on bearings on the cross-tree *e*, into notches, in the heel or lower part of the topmast, or it may be kept in its proper place by wedges being driven tight between the crosstree, *e*, and the central crosstree *a*, as shewn by dots in fig. 9, or by any other means. When the topmast is to be struck, it is to be released from its position by raising and turning over the palls *i*, *i*, as shewn in fig. 10, or by knocking out the wedges or releasing it any other way, and by applying a sufficient power to turn the fid towards the topmast, which may be done by manual labour, by introducing levers or handspikes into the holes in the ends, *k*, *k*, of the fid, which project beyond their bearings, and on turning it partly round, the flat surface will form an inclined plane, as in fig. 10, and allow the projecting part of the heel (*h*) to slide down it, and pass through the tressels and cross trees. It will be understood that when the topmast is to be raised and secured again, the flat surface of the fid, is to be turned into the perpendicular position so as not to interfere with the mast as it rises, and when up, the fid is to be turned with the flat surface uppermost, and the mast let down upon it, and the palls turned over into their former position, or the wedges to be driven in. In order to render the fid firm and secure, and of sufficient strength to support the topmast, it is made to turn on a bed or bearing extending part or all its length, which bed may be a simple bar of iron, or of a fluted shape, as shewn in the drawing which the Patentee recommends as the best as it will hold any anti-friction material which may be used.—[*Inrolled in the Inrolment Office, November,* 1828.]

To William Strachan, *of Avon Eitha, in the parish of Ruabon, in the county of Denbigh, Manufacturer, for his having invented or found out an improvement in the making or manufacturing of Alum.*—[Sealed 12th June, 1828.]

SPECIFICATION.

"It is a well known fact that the Alum of Commerce has hitherto in this and other countries been principally if not wholly manufactured from substances, which contain combined naturally two of the constituents of that salt, the sulphuric acid and the alumine. It is also equally well known, that the green sulphate of iron (the copperas of commerce) is maufactured from the decomposeable sulphurets of iron, commonly called pyrites, and that this is effected by exposing these sulphurets to the action of the air in a heap, (called by the copperas manufacturers a bed), by which means a decomposition takes place, which being encouraged by rain and the throwing on of water, a liquid sulphate of iron is produced, which, after evaporation to a certain point, and saturation with iron, is allowed to crystallize, and forms the green sulphate of iron, or copperas. Now my invention and improvement consists in the making available for the manufacture of alum, the sulphate of iron, whether in the state of the raw liquid sulphate of iron, so used hitherto for the making of copperas, or of the crystallized sulphate of iron, or copperas of commerce.

Before I proceed to describe how I effect this, I will for the benefit of those persons, if such there be, who are not acquainted with what is by the copperas-makers called a 'bed,' describe what I consider the best mode of forming one.

"The ground on which it is intended to stand should in the first place have a low wall built round it, about eighteen inches high. This must be puddled and rammed such a covering of clay, as will be sufficient to form a water-tight bottom. The bed should have a considerable inclination or slope, in order that the liquor may run from it as quickly as it attains the bottom. The clay should be covered with bricks, flags, tiles, lead, or other substance capable of resisting the action of sulphuric acid, and the top of this last covering being even with the top of the wall, the whole forms a sloping, even surfaced platform. Upon this platform the pyrites are to be piled up or deposited, but I consider it is adviseable before depositing the pyrites, to lay a course of good sized round pebble stones, in order by raising the pyrites from the bottom, to admit air under, and consequently, through the pyrites, by which the decomposition will be greatly expedited, water being from time to time thrown over the pyrites; the liquid sulphate will be given out, and must be received in a cistern or other convenient receptacle at the bottom. The thicker the pyrites are heaped up, of course the stronger will this liquor run from the bed, which bed should however be six feet thick at the least. The size or superficial surface of the bed must of course be proportioned to the wants of the manufactory; the shape I do not consider a matter of much moment, though I prefer an oblong parallelogram, the slope falling to one of the longer sides, over the bottom of the 'bed,' of which shape the liquor will have a shorter distance to run, and consequently the chances of loss be diminished.

"I must here state that I do not claim the 'bed,' or the above method of forming one, as any part of my invention, for the purposes of which the pyrites may be placed in any other plan, manner, or form, as may be considered best and most convenient for effecting their decomposition, the foregoing instructions being only given as a description of what I consider the best mode of exposing the pyrites, for decomposition, and obtaining the greatest quantity of the resulting liquid sulphate of iron. Supposing therefore, a supply of liquid sulphate of iron, arising from the decomposition of the material pyrites of iron, however placed for the purpose of decomposition. Or if from any circumstances it shall be deemed preferable to use it, the crystallized sulphate of iron, or copperas of commerce to be at hand, I proceed in this order to make the sulphate of iron (in either state) available in the manufacture of alum, I procure a quantity of aluminous clay, or earth, or other substance, containing alumine as white and as free from iron as possible, and also as clear from gravel and other contaminating matter, as is to be had.

" I have from experience found the light grey coloured clay shale found among the coal mines, answer the purpose extremely well. Whatever aluminous substance may be used, it is advisable, by grinding with rollers, pounding, or some other such method, to reduce it to an even degree of fineness; but this is not absolutely necessary, and I practise it only as a means of making lighter the labour. In the next part of the process this aluminous matter I ultimately mix and impregnate with a quantity of the liquid sulphate, arising from the decomposition of the material pyrites of iron, or of the crystallized sulphate, or copperas of commerce, and submit the mass or matter so impregnated to the action of heat. This may be done in a furnace, kiln, oven, or other convenient contrivance, by putting the aluminous matter therein, and when there, and while under the action of heat, throwing in or otherwise applying the liquid sulphate of iron, or other aluminous matter which may first be mixed and impregnated with the liquid sulphate of iron, and then thrown into the furnace, kiln, oven, or other contrivance, and there subjected to the action of heat, until it is thoroughly dried and calcined.

"I should observe that when the crystallized sulphate of iron, or copperas of commerce is used, it may be employed either in the state of crystals, or it may first be dissolved in water. If, in the state of crystals I should recommend a small quantity of water to be thrown upon the mixed clay and crystals when in the furnace, in order to assist the water of crystallization of the copperas, in disseminating the sulphate more evenly through the mass. When the impregnated clay is sufficiently calcined, it will have assumed a pale red colour, and is to be raked or drawn out, and in a cistern, or other convenient receptacle, lixivated by being covered with water, and from time to time stirred or plunged up. When the water has extracted from the impregnated matter or substance, all its available strength, which it will have done in about three days, it will be formed into a liquid sulphate of alumine, varying in strength in proportion to the strength of the liquid sulphate of iron, and the quantity of it employed to impregnate the aluminous matter, and the quantity of water used to lixiviate the calcined aluminous substance after it has been so impregnated. This liquid sulphate of alumine is now ready to be converted into the alum of commerce, by being combined with the alkali, and treated in the usual mode adopted by the manufacturers of alum, from the materials in common use.

The effect of this process of impregnation, calcination and lixiviation, is this, the iron being by the heat so far oxidized as to have become insoluble, the sulphuric acid, the other constituent of the sulphate of iron, seizes on the alumine contained in the matter or substance with which it was mixed, and forms the sulphate of alumine which is dissolved, taken up, or rendered liquid by the water with which the impregnated mass is lixiviated.

" Having thus stated the combination of which my invention consists, I shall proceed to describe the apparatus, and method I have adopted for applying those principles to practice; I pass the clay, earth, or other aluminous matter I intend using through iron rollers, and when sufficiently crushed and prepared, I throw about thirty hundred weight into the furnace.

" This consists of a common arched reverberatory oven, about nine feet long by six feet wide, having at one end, a fire place, extending the whole breadth, and separated from the floor on which the matter to be acted upon is placed, by a bridge or midfeather; at the other end is the chimney; in front are three springs with sliding iron doors for charging and discharging the furnace, and stirring the contents during the operation. The fire I keep at a moderate heat, until the clay, earth, or other aluminous matter is dry, when I proceed to throw in the sulphate of iron upon the aluminous matter, stirring the mass up with rakes; this is continued until the whole dose of sulphate (which may be from four to five hundred weight if the crystallized be used, or from one to two hundred gallons, if the liquid) is thrown in, when the fire is urged higher, the raking being continued adding from time to time water, when the crystallized sulphate is used, until the impregnated clay, earth, or other aluminous matter is quite dry, and so calcined as that the iron which was contained in the sulphate of iron, is so far oxidized as to have become insoluble. When this is effected, which may be known by the mass having assumed a highly reddish color lixiviation, for the purpose, I have a row of stone cisterns about two feet deep, and each of sufficient capacity to contain one charge of the oven or furnace, and as much water as will cover it well; I have also one general receiving cistern, so placed as to receive the liquor from all the extracting cisterns.

"The impregnated and contained clay, earth, or other aluminous matter, is when sufficiently calcined, raked out of the oven or furnace, and put into one of the extracting cisterns and covered with water; after remaining for two or three days being stirred and plunged up frequently, it is let off into the receiving cistern, and is now ready for evaporation. Instead however, of immediately running this liquor (which is the liquid sulphate of alumine) into the evaporator, I think it desirable, in case the strength should be less than fifteen per cent above water, (which will depend upon the strength and quantity of the sulphate of iron used) that the liquor should be returned over freshly impregnated matter, until it has attained that strength.

"The boiler I use for evaporation and which I have found very effective, is an arched chamber, twenty-two feet long, seven feet broad, and three feet deep from the spring of the arch, formed of stone, and arched with brick, having at one end a fire place, extending the whole breadth, separated from the body of the chamber, by a watertight bridge or midfeather. This boiler chamber or cistern being filled with the liquid sulphate of alumine, to within a few inches of the top of the bridge or midfeather, the flame or heat radiates down from the arch, and sweeps over the whole surface of the liquor, taking the steam produced with it up the chimney in a continued stream, the evaporator being supplied with fresh liquor as the water is thrown off.

"This is the contrivance I use, but of course any other method may be pursued as thought best. During the concentration the alkali, (the other constituent of alum) is to be added. This may be either the muriate of potash, the sulphate of potash, potash itself, or any other salt usually employed by alum makers, though I prefer the first. I consider it best to allow the evaporation to proceed until the liquor is concentrated, to from thirty to thirty three per cent above water, before adding the alkali, the proportion of which will be the same as commonly used by alum makers, and must of course depend on the quality of the alkaline salts employed. When the alkali has been added, the concentration is to be carried on till the liquor has attained the strength of from thirty five to thirty eight per cent above water, it is then to be let or drawn off into coolers, for crystallization; at the end of about ten days, the mothers may be drawn off, when the alum will be found in crystals in the cooler. These crystals are to be washed redissolved in clean water and again crystallized and thus repeated.

" It is now pure alum and fit for all uses to which alum can be applied, but as alum is generally sold in large masses (the process of forming which, is called "rocking") it may for this purpose be again dissolved in a small quantity of water, as will at the greatest degree of heat, which can be communicated to it, take up in solution, and run it into casks or tubs so constructed, as to be easily taken to pieces and again set up; in these it should remain from ten to fourteen days, when the mothers may be let off, the casks taken to pieces and the alum broken or cut up into pieces for sale.

" I must here observe, that the clay, earth, or other aluminous substance, which has been impregnated with the liquid, sulphate of iron may after being lixivated serve for the same purpose, for a considerable number of times varying with the quantity of alumine contained therein originally until the whole alumine has been taken up by the successive applications of the sulphate of iron, and also that the mothers of the first and all the subsequent crystallizations may be used over again without limit, I must also observe that all the vessels and apparatus used in the manufacture, must be composed of materials capable of resisting the action of sulphate.

And after having fully described the whole course of my mode of manufacturing alum, using for the purpose of such manufacture from the sulphate of iron here, to prevent mistake or misconception, explicitly state and declare of what my invention and improvement consist. I do not claim as my invention the "bed" or the mode of forming one 1 have pointed out. Nor do I claim, as my invention, any part of the apparatus or process by which the liquid sulphate of alumine as converted into the crystallized alum of commerce; what I do claim as my invention, and an improvement in the manufacture of alum, is the new combination in making available in the manufacture of alum; the sulphate of iron, whether in the state of the liquid sulphate, resulting from the decomposition by exposure to the air and water, however they may be placed for that purpose, of the decomposable sulphurats of iron, commonly called pyrites, or of the crystallized sulphate of iron or copperas of commerce, by producing from the same, combined with clay, earth, or other substance, containing alumine, a liquid sulphate of alumine, which being treated with the usual mode adopted by alum makers, may be formed into alum for the purpose of forming this liquid sulphate of alumine; I do not intend to confine myself to the apparatus, or mode of using the apparatus I have before described, or to any other particular apparatus or process, but do for this purpose claim and assert my right to extend to all and every apparatus, by which may be effected the object required, namely, the mixing or impregnating aluminous clay, earth, or other substance, containing alumine with the sulphate of iron, in either state, exposing the clay, earth, or other substance, so impregnated to the action of a heat. sufficient so far to oxidize the iron, as to render it insoluble, and by means of water dissolving, taking up and forming the liquid sulphate of alumine.—[*Inroled in the Inrollment Office, Oct.* 1828.]

To JAMES WATT, *of Stracey-Street, Stepney, in the county of Middlesex, Surgeon, for his having discovered, by the application of a certain chemical agent, means by which Animal Poison may be destroyed, and the disease consequent thereon effectually prevented.*—[Sealed 29th April, 1828.]

IT has always appeared to us to be a useless expenditure of money to obtain Letters Patent for a *medicine*, which, being once known to be an effective remedy against, or cure for any particular disorder, and its constituent parts published in the specification, may be prescribed by every physician without the knowledge of the Patentee; or even with his knowledge, as far as we can, without any legal means of his preventing it. These remarks apply generally to all patent medicines, and particularly to the subject now before us, which is merely a wash to be employed as a preventive or destroyer of an animal poison, which is the term given by the Patentee to certain contagious diseases.

When the disease is supposed to have been contracted by contact with a contaminated person, the injured part is to be thoroughly washed with soap and water, and then with water strongly impregnated with chlorine. Indeed, the part is to be soaked with the liquor, and covered for some time with cloths rendered completely wet by immersion in the liquor.

It is recommended that the water should be impregnated with chlorine gas, by means of a force pump in a close vessel in the way that soda water is commonly made; and when so prepared it may be bottled up for use, taking care that the bottles are carefully stopped.

In some cases it is proposed to employ the chlorine in the form of gas, but when that is not convenient, the lotion above described is to be used.—[*Inrolled in the Inrolment Office,* October, 1828.]

To BENJAMIN AGER DAY, *of Birmingham, in the county of Warwick, Manufacturer, for his having invented Improvements in the manufacture of Picture Frames in various ways, forms, and sizes.*—[Sealed 28th August, 1828.]

THE invention specified under this Patent is for making picture frames of stamped or pressed metals, or a mixture of metals, which are to be japanned, lacqured, or coloured, to represent those picture frames which are usually made of paper japanned. The invention is comprised under three heads—first, making picture-frames of metal, which are to be stamped into the proper form and pattern by the punches and dies prepared for the purpose, and when made in pieces, are to be soldered together.

The second feature proposed, is the introduction of Gothic or other architectural ornaments in the corners and those parts of the frame which the glass is to fit into; and the third, is the making of these Gothic ornaments occasionally of paper moulded and japanned.—[*Inrolled in the Inrolment Office*, October, 1828.]

To JOSIAS LAMBERT, *of Liverpool Street, in the city of London; Esq., for his invention of an Improvement in the process of making Iron applicable to the smelting of the ore, and at various subsequent stages of the process, up to the completion of the rods or bars; and a new process for improving of the quality of inferior Iron.*—[Sealed 4th February, 1830.]

To improve the quality of iron the Patentee proposes, when it is near, or while in a state of fusion, to introduce into the furnace salt, potash, and lime, which he conceives will assist in decomposing the earthy matters in connexion with the iron, particularly in the smelting process. We do not perceive the novelty of this process, as salt at least has been long applied with beneficial effects in different stages of the manufacture of iron, and particularly in the puddling furnace. See *Luckcock's Patent*, vol. x. p. 250, of our First Series.

SPECIFICATION

"This improvement in the process of making iron applicable at the smelting of the ore and at varieus subsequent stages of the process up to the completion of the rods or bars, consists, in the application of salt, potash, and lime, mixed or combined together to the iron ore or iron in the blast furnace, the refinery furnace, the puddling furnace, the balling or reheating furnace, or in any other process to which the iron in its manufacture is subjected when considerable heat is applied; and it likewise consists, in the application of salt, saltpetre, and lime, mixed or combined with the iron in the puddling furnace, whether the same iron shall have been subjected to the application of salt, potash, and lime, in any of the previous operations of the manufacture or not.

" The proportions in which I recommend the mixture or combination of salt, potash, and lime, to be formed, are two parts of salt, one part of potash, and two parts of lime; but should the proportions in some degree differ from those best adapted to the purposes the useless portions will be dissipated in the process of the manufacture.

" The mixture or combination employed during the process in the blast furnace should be applied at the time of smelting the materials, which are to produce the iron at the rate of about twenty-five pounds to the ton of iron, and may be introduced in proportinate quantities at the tunnel head of the blast furnace, either at intervals, or with every charge of the materials which are to produce the iron. If not used in the process of smelting, it may be applied at intervals to the metal during the operation in every charge of the refinery furnace, or in the puddling furnace, or in any other process to which the iron in its manufacture may be subjected when considerable heat is applied.

" A proper proportion to be used in the refinery furnace may be at the rate of twenty pounds to the ton of iron, and in the puddling furnace about eighteen pounds to the ton of iron; but in the balling or reheating furnace and other processes, the quantity to be applied must depend upon the quality, form, and substance of the iron, taking care that it be sprinkled over and amongst or brought in contact with the iron; the quantity to be employed will vary from about eighteen to thirty pounds per ton of iron.

"The proportions in which I recommend the salt, saltpetre, and lime, to be mixed or combined, are two parts of salt, one and a half parts of saltpetre, and two parts of lime. This mixture or combination of salt, saltpetre, and lime, should be applied to the iron in the puddling furnace whilst the metal or pig iron is in a state of fusion, and may be mixed with it at intervals at the rate of about twenty pounds to the ton of iron. The quantities to be applied of either of the above mixtures will differ in some degree according to the quality of the materials or the iron: but the proportions above mentioned are those proper on the average.

"The process for the improving of the quality of inferior iron, consists in the application of either of the same mixtures in similar proportions to such iron when subjected to considerable heat: for this purpose they may be applied to the iron, and the iron melted in combination with them, or they may be applied to the iron in the puddling furnace in such quantities as may be best adapted to improving the quality of the iron according to its properties more or less exhibited, of being what is termed red-short or cold-short, (that is to say), the application of the mixture of salt, potash, and lime, is best adapted to the iron which is termed red-short, and the mixture of salt, saltpetre, and lime, is best adapted to the iron termed cold-short.

"The quantity of the mixtures to be employed in either case, will vary from about eighteen to thirty pounds per ton of iron, according to the degree of inferiority of the iron; or the mixtures may be applied to the iron in any reheating or other furnace, and the metal subjected to a red heat for a time proportioned to the quality, form, and substance of the iron, care being taken that the mixtures be applied in contact with the heated metal; and for this purpose, if the iron be in the form of tubes, such as gun barrels, the mixtures may be introduced into the tubes."—[*Inrolled in the Petty Bag Office, April,* 1830.]

Novel Inventions.

Improvements in Spinning.

AN ingenious mechanic in America, named Dornforth, has invented a very simple improvement in spinning machinery, which is attracting very considerable notice at Manchester, and appears to afford the means of producing the finest yarns without the great risk of breaking, to which yarns of the higher numbers have been so much subject, when wound on to the bobbin by the flyer as heretofore.

The contrivance consists of a stationary spindle, from the top of which a circular polished rim is suspended instead of a flyer. The bobbing being made to revolve, rapidly spins or twists the yarn as it descends from the drawing rollers, and the slight friction of the yarn, as it goes round against the stationary polished rim, aided by the resistance of the atmosphere, produces that retardation which causes it to lap up or wind on to the bobbin.

The invention is secured by patents in the different European States; that in England is in the name of John Hutchinson, Esq. of Liverpool.

SOCIETY OF ARTS.

The Rewards adjudged by the Society, 1830, *presented by the Earl of Radnor, Vice-President.*

To J. Peart, Esq. Settle, Yorkshire, for improving land lying waste, the gold Ceres medal.

— W. Burton, Esq. Field Hall, near Uttoxeter, Staffordshire, for his swing frame for turning cheese, the large silver medal.

— Mr J. Chancellor, Dublin, for his clock escapement, the large silver medal, and 25*t*.

— Mr. James Harrison, Barton on Humber, for his clock escapement, the large silver medal, and 10*l*.

— Ditto, for his fly for turret clocks, the silver Isis medal, and 10*l*.

— Mr. H. Wilkinson, Pall Mall, for his oil for chronometers, the gold Isis medal.

— the Rev. G. S. G. Stonestreet, Halton, near Hastings, for his tide semaphore, the gold Isis medal.

— Mr. J. Bothway, R. N. Plymouth, for his method of securing the lower yards of ships of war, the large silver medal

— Commander W. H. Hood, R. N. for a rocket staff, the largo silver medal.

— the Chevalier Aldini, for his apparatus for the use of firemen, the gold Isis Medal.

— Mr. J. Braidwood. Edinburgh, for his fire escape, the large silver medal.

— Mr. J. Henfrey Bowling-green-street, Kennington, for his fire escape, the large silver medal and 10*l*.

— Mr. J. Reilley, Finsbury-place, for an adjustable pack saddle, the silver Isis medal.

— Mr. T. R. Yare, Dean-street, Soho, for a muzzle for cribbiting horses, the large silver medal.

— Mr. W. H. Hilton, Regent-street, for an instrument for boring the bung-holes of casks, the large silver medal.

To Mr. Samson Travis, Gray's-street, Blackfriars Road, for a dowel box for boring sash frames, the silver Isis medal, and 5*l.*

— Mr. W. Dungey, New Compton-street, Soho, for a carpenter's holdfast, 5*l.*

— Mr. T. Lowthorp, Watlebury-street, Euston-square, for his emery cloth, the silver Isis medal, and 5*l.*

— Mr. J. Good, Hereford, for his syphon well, the large silver medal.

— Mr. J. Ritchie, Stafford-street, Bond-street, for his photometer, the large silver medal.

— Mr. J. Roberts, Queen-street, Cheapside, for his reflectors to the miner's safe lamp, 5*l.*

— C. Verrall, Esq. Seaford, Sussex, for his prone couch, the silver Isis medal.

— Mr. George Bunney, Lower Eaton-street, Pimlico, for his surgical belts, the silver Isis medal.

— Mr. S. T. Brittlebank, South Molton-street, for a copy in Indian ink of a print, the silver Isis medal.

— Mr. H. J. Vully, Angel-lane, Hammersmith, for a copy in chalk of a head, the silver Isis medal.

— Mr. C. Gwatkin Hill, Regent-street, for a copy in oil of a portrait, the large silver medal.

— Mr. Geo. Fred. Duncumb, Paradise-row, Chelsea, for a copy in water-colours of flowers, the silver Isis medal.

— Mr. W. Dickes, Temple-street, Southwark, for a copy in pencil of animals, the silver Isis medal.

— Mr. S. Stevens, Harleford-place, Kennington, for a copy in pencil of a print, the silver Isis medal.

— Mr. W. King Toase, Little Queen-street, Holborn, for a copy in oil of a portrait, the large silver medal.

— Mr. W. Barth, Cockspur-street, for a copy in pencil of animals, the silver Isis medal.

— Miss Du Pasquier, St. James's Palace, for a copy in chalk of an historical subject, the silver Isis medal.

To Miss Vendramini, Chiswick Mall, for a copy in chalk of an historical subject, the silver Isis medal.

— Miss Belinda S. Wiggins, Piccadilly, for a copy in oil of a landscape, the silver Isis medal.

— Miss Sharpe, Fleet-street, for a copy in chalk of a figure, the silver Isis medal.

— Miss Lester, Elm-street, Gray's-inn-road, for a copy in India ink of a figure, the silver palette.

— Miss Lucy S. Richardson, Queen's Row, Pentonville, for a copy in chalk of a head, the silver palette.

— Miss Louisa J. Holden, Dartmouth-street, Westminster, for a copy in chalk of a head, the silver Isis medal.

— Miss Augusta E. Cole, Red Lion-square, for a copy in pencil of a landscape, the silver Isis medal.

— Miss Fanny Crockford, Sussex Place, Regent's Park, for a copy in water-colours of a landscape, the silver Isis medal.

— Miss S Lockwood, Doncaster, for a copy in water-colours of flowers, the silver palette.

— Miss Mary A. Richardson, Queen's Row, Pentonville, for a copy in water-colours of flowers, the silver Isis medal.

— Mr. S. Blackburn, Upper Charlotte-street, Fitzroy-square, for a drawing in outline from a statue, the large silver medal.

— Mr. J. Reed, Charlotte-street, Bloomsbury, for a finished drawing from a statue, the silver Isis medal.

— Mr. W. E. Frost, High-street, Wandsworth, for a finished drawing from a statue, the large silver medal.

— Mr. J. Clements Miles, Aldenham Terrace, Old Pancras Road, for a drawing in chalk from a bust, the large silver medal.

— Mr. J. Callcott Harley, High Row, Kensington Gravel Pits, for a drawing in chalk from a bust, the silver Isis medal.

— Miss Mary A. Williams, Charlotte-street, Bloomsbury, for a drawing in chalk from a bust, the silver Isis medal.

— Miss Frances Burrell, Park Square, Regent's Park, for a drawing in chalk from a bust, the large silver medal.

To Mr. Jos. J. Jenkins, Great Queen-street, Lincoln's Inn Fields, for an original drawing in water-colours of figures, the large silver medal.

— Miss Fanny Corbaux, Hercules Buildings, Lambeth, for an original portrait, a miniature, the gold Isis medal.

— Mr. J. Scott White, Brownlow-street, Holborn, for an original portrait in oil, the large silver medal.

— Mr. R. Williams Warren, Red Lion-square, Holborn, for an original portrait in oil, the gold Isis medal.

— Mr. T. W. Dagnall, Winstone Terrace, Waterloo Road, for a landscape composition in oil, the silver Isis medal.

— Mr. G. Sims, Davis-street, Kennington, for a landscape composition in oil, the large silver medal.

— Miss Leonora Burbank, Church-street, Camberwell, for a composition of flowers in water colours, the silver Isis medal.

— Mr. Philip Purcell, Dunt's Hill, Wandsworth, for a composition of flowers in water colours, the large silver medal.

— Mr. J. Alex. Mitchell, 5, Great Pulteney-street, Golden-square, for an original painting in oil, of animals, the large silver medal.

— Mr. Jos. Tanner, Little Russell-street, Covent-Garden, for an original painting in oil of still life, the large silver medal.

— Miss Caroline Eggbrecht, Frith-street, Soho, for an original drawing of a landscape, the silver palette.

— Miss Charlotte A. Lester, Elm-street, Gray's Inn Road, for an original drawing in water colours of a flower, the silver Isis medal.

— Miss A. Redaway, Frith-street, Soho, for a composition of flowers in water colours, the large silver medal.

— Miss Mary Atkinson, Grove End, St. John's Road, for an original drawing in water colours of a flower, the silver Isis medal.

— Miss Chappell, Ockbrook, near Derby, for an original painting in oil of animals, the large silver medal.

To Miss Mary E. Best, York, for a composition of still life in water colours, the large silver medal.

— Mr. Alfred H. Taylor, Rathbone-place, for an original portrait in chalk, the silver Isis medal.

— Mr. J. Ginn, Hollywell-street, Millbank, for a model of a bust from the antique, the large silver medal.

— Mr. J. Bell, Charlotte-street, Bloomsbury, for a model of a bust from the life, the large silver medal.

— Mr. Fred. Orton Rossi, Grove-street, Lisson Grove, for a model of a figure from the antique, the silver Isis medal.

— Mr. Joshua Manning, Tottenham Court Road, for an original model of a group, the gold Isis medal.

— Mr. James Stevenson, Upper Seymour-street, Somers Town, for an engraving of an historical subject, the large silver medal.

— Mr. H. Bateman Jenkins, Great Queen-street, Lincoln's Inn Fields, for an engraving of a portrait, the silver Isis medal.

— Miss Elizabeth Branston, Golden Terrace, Pentonville, for an engraving on wood of an animal, the large silver medal.

— Mr. J. Brett, Dolphin Place, Holborn, for an engraving of a head, the large silver medal.

— Mr. Fr. F. Cuisset, Castle-street, Holborn, for an intaglio of animals, a copy, the silver Isis medal.

— Mr. T. J. Woodbridge, Banner-street, St. Luke's, for a copy of an historical subject in embossed silver, the large silver medal.

— Mr. S. West, Henrietta-street, Brunswick-square, for a perspective drawing of an ornamented capital, the large silver medal.

— Mr. George Moore, Welbeck-street, for an original design for a village church, the large silver medal.

— Mr. S. C. Brees, Warwick Court, Holborn, for an original design for a village church, the gold medallion.

— Mr. Daniel Squirhill, Grove-street, Lisson Grove, for an original design for a fountain, the gold Isis medal.

To Mr. Allen Webb, New Burlington-street, for a coloured anatomical drawing, the large silver medal.

— Mr. J. Henry Walsh, King street, St. James's-square, for a coloured anatomical model, the gold Isis medal.

— M. Felix Feuillet, Paris, for his method of transferring prints, the large silver medal.

— Mr. A. R. Burt, Chester, for his portable easel, the silver Isis medal.

— Mr. R. Cowling Taylor, Carlton Chambers, Regent-street, for his models of part of the South Wales coal field, the gold Isis medal.

— Mr. S. Dean, Grosvenor Place, Bethnal Green, for his machine for punching pattern cards for the Jacquard loom, 10*l.*

— Ditto, for his improved silk loom, the silver Isis medal and 10*l.*

— Mr. W. Jennings, Manchester-street, Waterloo Town, Bethnal Green, for his improvements on the Jacquard silk loom, the large silver medal and 15*l.*

— Mr. George White, Glasgow, for his power-loom for fine fabrics, the large silver medal and 25*l.*

— Lieut. H. Lister, Maw, R. N. for pigments, &c. collected by him in South America, the large silver medal.

ARTHUR AIKIN, SEC.

REPORT

Of the Select Committee of the House of Commons on the Laws of Patents.

(Continued from page 242.)

Mr. John Farey, called in; and Examined.

WHAT do you think of the law which allows you to take out a patent for an invention communicated to you by a foreigner, and not allowing you to take out a patent for an invention communicated to you by a British subject?—I am not aware of any advantage in it, except as the contrary might tend to be a premium to the fraudulent obtaining of inventions. If the invention were fairly assigned, there is no reason whatever why a patent should not be taken out by the assignee, and in many cases with great advantage; because it so constantly happens, that the inventor is not so well qualified to pursue his invention into actual practice, as some other person, who for that very reason would become the purchaser, if encouraged by law.

If it can be proved that fraudulent possession has been obtained of the invention, it should be restored to its owner, or full compensation made?—Certainly; there can be no objection to patents to assignees of inventors; it would be a very great advantage indeed to make such a law; there was a bill before the House, some years ago, which I think contained that as one part of the provisions.

May not the present law operate with great injustice to the widow and children of an inventor, who dies before his patent is taken out?—The executor or administrator can take out a patent in that case; that is the reason in the case I have before mentioned, why eighteen months was granted; that is not by law but by custom. If a patentee dies before he signs and acknowledges his specification, the patent is lost, but the executors may take a new one, provided the secret has not got abroad, and they pay all the fees over again. The useless ceremony of appearing before a master to acknowledge, is sometimes a hardship in such cases. My brother took a patent, and fell ill by a paralytic stroke, before the specification was due, but the draft had been made out, and in very good time he signed the deed in bed; but after that it was very nearly lost, because he could not get out to acknowledge, as he had expected to be able to do; and if the master had not come to his bed room at the very last, the patent would have been lost.

Since a patent for the three kingdoms, with the attorney's bill, costs from four to five hundred pounds, does not that operate as a tax upon different inventions with great inequality? The expense of the patents for the three kingdoms is decidedly too high, but I do not think that the expense of a patent for one kingdom is too high; I think that the present expense of a patent for England, would be about the proper expense for a patent for the whole of the British dominions. I mean, that in the absence of any other check to an unlimited multiplication of patents, they should not be granted too cheaply. At present, while patents are to be had merely for paying the fees, there must be some limitation applied by means of the expense, and I think the present expense of a patent for England is a limitation which is sufficient; but when to the expense of a patent for England, the expense of one for Scotland, and another for Ireland, is added, and also an additional variable expense depend-ing upon the difficulty of the subject, the sum total is in my opinion too much for mere limitation, and becomes a tax upon particular inventors, who are commonly the most deserving of encouragement.

Does any method occur to you of having the cost of a patent made proportionate to the importance of the patent?—Possibly it might be desirable to make little or no expense in the first instance, but to apply an annual and increasing tax upon the continuance of the patent right. To make the annual tax scarcely any thing at first, but to make it afterwards such a progressive tax from year to year, as would at last induce inventors to abandon the right before the end of the term, which in that case should be longer than at present (say 21 years). If the inventions were not very good ones, the patents for them would be cut off by this course, sooner or later. On such a plan, government might always ease a deserving inventor, by remitting his tax, when he had not been properly rewarded. But this is only a first thought, which I have not pursued through all its consequences; it would require much regulation. The proceeds of such taxes might be accumulated as a fund, to reward meritorious inventors, whose patents, like Mr. Woolf's, have not produced them a proper recompense for the services they have rendered to the community; also to purchase valuable secrets, which patents cannot be expected to protect.

You stated, in certain cases, that a part of the expense of taking out a patent consists of payments to professional gentlemen, does that arise from any useless complexity in the law respecting specifications?—Yes, it does; to the complexity of the process of obtaining a patent; and the necessity of specifying completely in a given time, which is often too short. It applies very forcibly to the law proceedings upon patent rights, which does not permit amendments or improved specifications. In obtaining of patents, the costs that are occasioned by payments to the officers of the Crown are fixed and invariable, except in a few cases, the others, relating to the specifications are necessarily variable, and according to the nature of the subject. I think that the sum total to the patentee should be made invariable, or nearly so.

Benjamin Rotch, Esq. again called in; and Examined.

You proposed giving the Committee some more evidence?—It was only on one subject more I proposed to give any evidence upon, except it might be elicited by questions; it was merely on the subject of invalidating a patent because any one trifling thing in it happened not to be new; and the case that is perhaps the strongest case in point upon the subject, is the case of the chain cable. There was a trifling thing connected with the anchor introduced into that patent, and though the chain cable itself was of special importance, the patent was upset because something connected with the anchor was introduced into that patent which was proved not to be new. I should think it was extremely desirable some provision should be made for the public to have the use of that which is not new in the patent, but that still the patentee should have the benefit of what remained; this, of course, would open a door to patentees making experiments with the public feeling; they had not the responsibility they have now, and which is a very useful check if they did put in any thing old. They would try experiments, and to guard as much as possible against this, I have one suggestion I wish to lay before the Committee, and that is, if any thing should be found in the patent that is old, *a certain portion of the term* should be forfeited thereby, merely as a check upon the patentees; whatever that portion may be, may be a matter to be filled up afterwards, if the suggestion was thought worthy of notice; and having stated that I have no further suggestions to volunteer than what will be found upon the notes of the evidence I have already given.

Will you have the goodness to describe how they brought in something about an anchor in a patent for a chain cable?—I really forget; I do not recollect the patent sufficiently to state what it was.

From your experience, do you find there is much uncertainty in the opinion of Judges as to the law of patents?—Very great, insomuch so that it is constantly advised by barristers, withdraw your record to-day, because such a Judge sits for such an one who is ill; withdraw your record; they dare not try it; and if a country cause is going to be tried, why did you not lay your venue in Middlesex, before Lord Tenterden, who takes a very liberal view of patents; why did you lay the venue in the country, to try it before a Judge who has a very contrary feeling? The whole I have submitted to the Committee was with a view to establish a certainty, and not to admit of this fluctuation; because my own knowledge tells me, there are hundreds of patents that might be brought out, but which people will not bring out; first, from the difficulty of sustaining the patent; and, secondly, because if they go to the expense of machinery, and complete the manufacture without a patent, they get nothing by it, because their neighbours do the same immediately, and there is no inducement for private individuals to bring them forward: if a large manufacturer does it, it may be an advantage to the general body, but not to himself particularly; but you do not get individuals often to look so far as that; the expense being great, unless they can *recoup* themselves, they do not think it worth while to bring it forward; but certainly the greatest point is the indecision of the Judges in deciding what is the object of the patent, because it is generally on the wording of the title of the patent with regard to the specification that patents are upset on the specification, and it is not one time in ten that the patent is upset on the specification, merely because it does not describe the invention in a way that will enable a workman of common ability to execute it; but the grand difficulty is the uncertainty of the opinion of the Judges as to what is the subject of a patent, in fact, what is the meaning of the word manufacture; and I think, after the reference made to Lord Tenterden's opinion, nothing can show more completely how much they are at sea upon the subject; where a Judge says, it is often taken to mean so-and-so; those words are quite distressing to advocates, they do not know how to advise.

Does not it follow, you are very frequently in the habit of advising a compromise where it is offered; where it would be much better if the Judge and the jury understood the thing, not to compromise at all?—Very often, indeed.

Are you aware of any cases where persons have compromised upon any understanding in the trade, so as to restrain the use from other parties?—Frequently.

Can you mention any cases?—No, I cannot; it will be a sort of breach of professional confidence to mention the cases that have come before me by name.

Mr. John Isaac Hawkins, called in; and Examined.

Are you acquainted with the law in Austria as to granting patents?—I have a copy of it.

Will you be so good as to put it in?—[The witness delivered in the same, which was read. Vide Appendix (F.) I will also put in a list of the number of patents taken in Austria the first six years of the existence of this patent law; it began in 1820. Here is a statement of the number of patents taken out in Austria, and in France and England, in the six years succeeding. [The witness delivered in the same.] See Appendix (F. 1.)

Do you know any thing of the working of that law?—Very little.

What number of patents were taken out in the six years preceding the new law?—In the preceding year, 1819, from February to June, twenty-seven patents were taken out; and in the year 1815 fifty eight; and in the succeeding year to the law coming into operation, one hundred and seven.

Have you any information to afford the Committee with respect to the patents in America?—The information I would offer is, that I published in America, thirty years ago, a view of the real nature of the law of patents, and objected to the patentee being charged any thing for the expense of having his exclusive privilege secured to him; and there the whole expense at that time, and the same expense now, is 30 dollars (6*l.* 15*s.* sterling.) I found many cases where poor men had found out an invention, and spent the whole of their money in bringing the invention to perfection, to whom it was felt a grievance, and I pleaded the cause of the poor in the public papers at that time, and since my arrival in England I have not seen any reason to alter that view. It seems to me that the great bulk of inventors are poor, and that they generally expend all their means in bringing their invention to perfection, and having so expended all their means, they cannot take out a patent unless they can find a monied man to produce funds; I have frequently undertaken to bring monied men and inventors together on that score, and have rarely succeeded in bringing them together, because the inventor is afraid to disclose his invention for fear of losing it; and the monied man is afraid to embark any money in it, because he cannot know the invention, and the negociation has generally failed on that ground.

Is it not commonly known among men of science, commonly considered as almost a proverb, that few men who are patentees ever reap the advantage of their own ingenuity?—I consider it almost proverbial; and I consider the expense of the patent is one cause of that state of things; I conceive the consequence of charging any considerable sum for patents is, that none but bold speculators take a patent, and hence it is that so few prove profitable: and my view is also, if patents were given free of cost, the public would be benefited by the inventions of the cautious and sober-minded, and thus a source of permanent wealth to the country would be opened. I am well acquainted with many cases in which a poor inventor has remained poor, while the capitalist has realized a great fortune by the invention, because the invention could not, before being patented, be shown to persons competent to judge of its value. I have been for more than thirty years in the habit of being consulted confidentially by inventors in England, France, America and Austria, and I have prevented a great number of patents being taken in England and France, by laying before the parties the difficulties they would be likely to meet with, in negociating with men of capital prior to taking a patent. I firmly believe I am, at the present moment, the confidential depository of important inventions, which, if they could be patented free of cost, and thus become marketable commodities, they would immediately occasion employment to thousands of people, and I have no doubt many other engineers could say the same. I know of several instances of valuable inventions having been lost to the public by the death of the inventors, when if the parties could have been made secure, they would have treated with capitalists, and the inventions probably have become important staple articles of manufacture. Within these two hours I have been consulted upon the subject of a rotatory steam engine; the inventor has kept it to himself forty years, and has not shown it to more than one or two persons; I was consulted by a capitalist, a gentleman who will advance the money for the patent, if I will give a favourable opinion of it when I see it, and I am to see it to-day. Having extensive acquaintance with men of invention and men of capital, I undertook many years ago to act as agent between the two classes, but was very rarely able to bring the negociation to a satisfactory conclusion, principally owing to the costs of the patent; and indeed I do not recollect that I ever succeeded in such a negociation, without taking upon myself the serious responsibility of recommending the invention, which recommendation common prudence generally hindered my given, even when I thought highly of the invention; and finding, from much vexatious experience, that such negociations tend only to waste the time of all parties, I have for some time declined attempting to bring capitalists and inventors together. I would propose patents to be put upon the same foooting as copyrights, or rather as statuary; there is an Act for the protection of artists in forming statuary. I would just draw a parallel between an artist and an inventor: if I take a piece of clay, and model the likeness of a human head, or any other form that my fancy may dictate, and cast a copy of the same in plaster of Paris, I have a patent or exclusive right to sell copies of it, by merely putting my name and date of publication upon each copy; but if I take the same piece of clay, and spend the same time on it and model a useful article, a tea-pot for instance, and cast it in metal, I must pay from 100*l* to 400*l*. for a patent for that article, which I consider a hardship. I would propose that the publication of any new discovery should constitute the evidence of exclusive right, and that the publication should consist in sending to certain offices written or printed copies of the specification, attested by the signature of the inventor, and also advertising for sale copies of the same for a reasonable price, in a certain number of newspapers; and I would argue, that the placing patents on that footing would tend to prevent monopoly, by opening a wide door to competition. It is apprehended by some, that the great increase in the number of patents which would be the consequence of throwing off all the fees, would occasion so much litigation as to become a great public inconvenience; my view is, that this evil, if it should be found to exist in the early stage of the change, would soon correct itself, because every trial of a patent cause would tend to enlighten the public mind, and enable persons to decide many critical points without an appeal to a court of law; it is very probable, that more litigation would be generated by the increase of a thousand ships employed in the commerce, than the increase of a thousand patents; but who would imagine that an addition of a thousand ships employed in the commerce of the country would be a public inconvenience? My argument would go to show, that a great increase of litigation would not be likely to take place, from the reason I have given; and that numerous disputed rights to inventions are, and would be continued to be settled by the knowledge of the parties themselves, or by the explanation of scientific friends and others, and a small portion only would come into court, as containing points of great difficulty. I would wish to give my opinion, that the greatest encouragement ought to be given to every species of invention. Should difficulties on the score of vested rights in fees, prevent exclusive privileges free of cost, the Austrian patent law may afford a model for raising a sufficient sum for compensating the possessors of such rights, without much oppressing the poor inventor. The whole costs of a patent in the Austrian Empire, including a population of thirty two millons, is 42*l.* 10*s.* for fifteen years, which is paid by annual instalments, beginning with 1*l.* a-year for five years, then rising ten shillings a year, and ending with 6*l.* for the fifteenth year.

Have you turned your attention at all to the difficulties arising from disputes upon patents?—I have had a good deal of experience, and been in court very often.

Do you consider that the patent system is ill adopted for decision?—Yes, because juries are generally totally ignorant upon the subject: if a special jury of men conversant with the subject was summoned, I should conceive the present system might be preferable to any board of commissioners; it would give more public satisfaction than any board of commissioners.

Is not a special jury necessarily a very expensive mode?—It increases the expense not a great deal; if it is a chemical patent it should be a jury of chemists.

Could you suggest any mode of getting a jury of that character in such cases?—I do not know that I could.

Did you ever consider the project of a commission?—Yes, I have considered it, and I think it attended with very great difficulty; I do not see how a commission can give satisfaction.

You think there would be too much jealousy?—It would be difficult to find commissioners who were not, some how or another, connected with the manufacture of the article that might come before them.

Might not the same objection apply to a jury; is it not probable that the persons selected would be interested in some way, or have a preconceived opinion upon the subject?—It would not apply so strongly as to a commission; in a commission there would not be more than five persons, perhaps; and upon the jury there would be twelve, and there would be less objection.

Would you have an equal objection to a commission, supposing the parties had the power of challenge?—Not so much in that case.

Do you think it would be possible to bring parties together to any scheme of arbitration?—I should think that arbitration would be better than a commission.

Do you think you could bring parties together before an arbitration?—It is now frequently done; I know of several patent questions settled by arbitration, and by the modern mode of arbitration much time is saved; it used to be that each party chose an arbitrator, and the two arbitrators met together and canvassed the subject; each arbitrator pulling to an opposite point, until they became two enemies. I have seen that repeatedly, and in that state of the case a third is chosen as an umpire, then all the arguments are to be gone over again by by those two arbitrators as counsel, and the umpire as judge; the modern practice is an improvement upon that, as the third arbitrator is chosen before any discussion takes place, and the three arbitrators meet and hear the question at once; each of the arbitrators are judges, and they do not mix up their own passions in the thing, and the decisions are come to much pleasanter by the three arbitrators at once.

You stated you objected to a commission; will you state what your view of a commission is to which you do object?—A set of men appointed, say five gentlemen appointed as a commission to judge of patents generally.

What would be your idea of five persons, men of science, being appointed to act both as jury and judge, constituting a court, and having before them the evidence brought in the same legal way, with advocates on either side as at present in court?—Provided such a commission were open to challenge, I should conceive that it would be a very useful mode of proceeding.

The question assumes that persons might be found above challenge for this commission; do you not believe such men could be found?—Yes, but I should doubt whether such men would, in the opinion of the losing parties be above suspicion.

They would not be worse off than with the Judges now, by your own act?—No.

He is considered, in many instances, incompetent for a mechanical or chemical subject?—Yes, he is.

Do you think, if the court had the power of ordering arbitration, it would be satisfactory to parties to have their cause so settled?—That is generally more satisfactory than the verdict of a jury.

At present the arbitration can only be by consent?—Yes, certainly.

Supposing the court ordered it, do you think it could be managed?—Yes, I think it would be tolerably satisfactory to the great bulk of persons.

Would you be inclined, in that case, to leave to the judge the power of selecting the arbitrators?—I think that that would not be likely to give satisfaction, unless there was some degree of choice, because the losing party would say the judge did not know, he appointed such a man of course.

Supposing they were made liable to challenge?—If they were made liable to challenge it might answer the purpose.

You think, in that case, the parties would be likely to agree? —Yes, they would be satisfied they had justice done them.

You were giving the Committee some information as to the American law, are you aware whether it is the practice there to lodge models of the inventions in the patent office?—It is not absolutely necessary, it is desired, and they rather favour the lodging of models; but the law does not render it absolutely necessary.

Supposing that part of the American system were introduced into this country, do you think inventors would frequently avail themselves of the power of lodging models in any public office for the purpose of an easy determination of disputes?—I should think a great number of models would be lodged; but I do not conceive it possible to oblige them to lodge models, because some things are not capable of being shown by model.

Do you not suppose it would conduce very much to the easy determination of disputes arising upon those questions?—Very much.

Would it not lead very much to piracy?—It might in some degree.

Are the specifications sealed now in America?—No.

Were they under the old law?—Yes, in 1790.

Do you know how it worked ?—Very disadvantageously.

Can you state how ?—The public were not able to know whether a person had a patent or not; a man asserted he had a patent, and there were no means of knowing whether he had or not; a great deal of unfair practice was suspected, but could not be proved.

Do you remember any case of a man working upon another's patent, and what was the result ?—I have known a patent worked under a concealed specification; another person has also worked against the patent, and the patentee has determined not to go into court on the subject, and has suffered the infringement because he would not have his specification unsealed.

Is the law of patents the same in all the States in America ?—Yes, it is one law in all the States.

One law includes the whole ?—Yes; there is one point as to the time of lodging the specifications. I should conceive, for various reasons, the specification should be the first thing, as I believe it is in all countries except England; in America the specification is the first thing presented; also in Austria, France and Holland.

Does it completely detail the invention ?—A perfect description of the invention.

Would you not allow the inventor to amend his specification ?—That is allowed in all those countries.

Is the specification made out at the time of the application ? Yes, at the time of the application in all countries but England. I have assisted a number of the inventors in preparing their specifications, and I have found that an inventor, as soon as he has his first idea, if he has money, runs away and takes his patent out under a general title, and when he comes to specify, he has only a parcel of crude ideas, which it is most difficult to form together to meet his title.

The Committee have been told, it would be exceedingly difficult to form a specification upon the first application ?—If you force the inventor to give a specification, he must give due consideration to the whole of his scheme in order to be able to describe it, and you will then have much more perfect inventions than you have now: when you give him time to prepare a specification, he will perfect his ideas before he embarks his money.

You do not think any great inconvenience would accrue to an inventor from being compelled to make out his specification on his first application ?—No, I think it would be conferring great benefit in compelling him to perfect his specification.

You would allow him to amend after the delivery of his specification ?—Yes.

Not after taking out the patent?—Yes, at any period of the term, but not to lengthen his term by so doing; the same as in France and Austria, they can add to their patents at any time, but the term is not prolonged by it; it might be a serious consideration whether the specification should be published so soon, before every thing is completed.

Are you in favour of having the specification always open?—Yes, always; I found great complaints in Austria. I have been during the last eighteen months in Vienna, and I found great complaints on account of sealed specifications; it is felt as a grievance there now; by mixing with scientific people, I found it continually spoken of as a grievance.

In what way?—They cannot know whether a man has a patent or not; a man asserts he has a patent; he has a patent for something under the name and title as published, but the public have no means of knowing, except by instituting a suit.

What would be the result of that suit in Austria, if it was found a person was actually working upon a specification of a patentee?—I do not know the penalty attached.

What has been the result of any one who has been so prosecuted?—I do not recollect.

Arthur Howe Holdsworth, Esq. a Member of the Committee; Examined.

Do you know of any case that has been compromised on an agreement to prevent third persons from working?—I remember, some years since, when at Worcester, to have been shown the factory of a person who was making patent net; I had never before seen the thing in progress, and was rather inquisitive of the man as to its details; he told me he was working upon the plan of a Mr. Heathcoat. I asked him upon what terms they worked; he said, "we pay so much per frame." I said, I thought there had been an action brought upon the subject, and that Mr. Heathcoat's patent had been destroyed; he said that it was carried into court, but the case was compromised; they had no doubt that the patent would have been destroyed, but it was deemed wiser by the trade not to proceed, provided he would undertake not to license above a certain number of those frames, so that the trade might not be too much extended, and induce too great a number of hands to enter into it; and, as well as my memory furnishes me, I think it amounted to about 500.

Do you think it would be expedient to give permission to parties to lodge models at some public office?—I conceive that the only effect it would produce, would be enabling trades persons, who took out patents for some particular articles of their own manufacture, to give it publicity; I conceive, for other purposes, patentees would rather object to it, because it will afford facility to the public in discovering the mode by which the patentee effects his purpose, which never perhaps would have been thought of by such party if he had not so seen it; a very dangerous matter, as the feeling of the public at present exists with respect to patentees, which are deemed fit persons to be plundered, and which I would thus exemplify: I had occasion myself to call upon some parties who were, as I believed, pirating a patent in which I was interested; whilst we were talking upon the subject, one of the party, a man in one of the first houses in England, coolly told me that my patent was good for nothing, and that we could prove it, if he went into court, adding, as if to confirm his position, that he had already spent in one instance 10,000*l.* to destroy another man's patent; a proof, I conceive, that nothing can be more dangerous than to oblige a patentee to expose more of his specification to the public than is necessary, while such feeling with regard to patents exists; for if it required 10,000*l.* to destroy the patent, it must at least have had a pretty good title, or it could not have been so well defended as it should seem it must have been.

[To be continued.]

A Practical Treatise of THE LAW of PATENTS FOR INVENTIONS. By Edward Holroyd, Esq. Barrister at Law, Commissioner of Bankrupts. London. John Richards. 1830.

THERE are many strong contrasts in the world, but there are few stronger than that which exists between law books and law deeds.

Lawyers are at once the clearest, and most obscure, the most dense, and most verbose of writers; obscure and rambling when they wish to bewilder their adversaries, or astonish their clients, pithy and clear when instructing their brethren or arguing before judges, they can, like the Cromwell of Sir W. Scott, at pleasure make many words with few ideas, or many ideas with few words. A legal instrument to the uninitiated, is a perfect Babel or confusion of tongues; a well written law book is to any man of common judgment and attention, a perfect model of an abstract; clear, dense, methodical, compressing the greatest possible number of ideas into the smallest possible space.

The business of a legal writer we take to be this , to explain the origin and intent of the common and statute law; to collect from the decisions and opinions of judges, the sense in which the law is to be taken, and the modifications that time and various states of society have brought about in its application; to deduce carefully from all these, rules of practice; to be sparing of his own opinions and full in citing high legal authorities, to the end that the reader may know what the law is, and how it is read, and that he may thence judge soundly of its bearing upon the cases that come before him.

To execute well such a task requires little originality of thought, but great industry and power of selection, and a clear but brief and unadorned style; these are the most essential qualities in a legal writer, and to judge of Mr. Holroyd by his present work, he is not deficient in them. His exposition of the Law of Patents is methodical, clear, and concise, and he has taken care to draw all his conclusions from the judgments of the Courts in important cases, extracting the pith of the arguments on particular trials, and the reasons of particular decisions, in order to apply the doctrines laid down in them to classes of cases.

The book is divided into nine chapters, of which the first is an introduction, treating of the common law respecting monopolies; the foundation of the Patent Law in the famous statute 21 James I., c. 3; and the several acts that have been past within the last 120 years for the copyright of books, prints, and busts. This chapter is interesting, as being a brief sketch of the origin of Patent Law, and is necessary to the completeness of a treatise, but we do not perceive that it has much bearing on the actual practice, and we presume the author was also of this opinion, for he has made it exceedingly brief. The second chapter dives into the subject matter, and treats "Of the nature of the invention for which a patent may be granted." On this Mr. Holroyd says, "The invention for which a patent may be granted must be a manufacture. The manufacture must have two qualities. 1st. It must be new as to the public use and exercise thereof in England. 2d. It must be useful to the public." And further, "Whether an invention be new and useful, is a question of fact proper for a jury. But it may safely be laid down, that whatever be the nature of the invention, whether the merit of it rest on discovery, or on improvement, novelty and utility must exist in a material degree. And if an invention consist in an improvement upon any thing, and that which constitutes the improvement be known, and has been applied before to a similar purpose, though never applied before to the specific thing which the patentee has applied it to, it will not possess sufficient novelty to be the subject of a patent."

It is impossible to define what is absolutely the law on this subject, because it is impossible to define the exact quantity of novelty and utility requisite to support a patent; Mr. Holroyd has however enabled the reader to form a tolerably clear idea of the feeling of the Courts, (or the tacit rule by which their judgments are guided), by a judicious selection of the opinions of Judges in various marked cases.

He is very full on the much argued point of the construction given to the word "manufactures," which he says according to the construction given to the statute, may be divided into two classes;—

"I. Things made.

II. Practice of making."

He classes things made into,

"1. *A thing made which is useful for its own sake, and vendible as such, or some part of such a thing:*

"As a medicine, stove, carriage, &c. &c.

"2. *A piece of mechanism, engine, or instrument for producing either old or new effects, by being employed to facili-*

tate or expedite the labour of the making of some previously known article, or in effecting some useful purpose; or a new part of such machine, engine, or instrument, whereby it is rendered more efficacious;

"As a lace machine, stocking frame, &c. &c.

"*II. Practice of making; or principles carried into practice in a new manner, or new result of principles.*"

This second head is divided into,—

"1. *An artificial manner of operating with the hand, or with instruments in common use*; *or a mode of employing practically art and skill, producing an effect useful to the public; or an improvement in any known manner of so operating or employing practically art and skill.*

"2. *A process, or combination of processes, in any art, producing an effect useful to the public;*

"*Or an improvement in a process, or combination of processes, in any art, producing an effect useful to the public.*"

This is the most extended construction that has been given by Courts to the word "new manufactures," and Mr Holroyd supports it by citing many authorities, especially the elaborate judgment of Lord Chief Justice Eyre, in Boulton *v.* Bull, which is in itself a treatise on the subject.

We have often heard it said that the Judges are not at all agreed upon the meaning of the words "new manufactures," but we incline to think that the apparent discrepancy of their decision, is not in the view taken by the Judges, but in the misapplication of the terms used by patentees, and in the wilful obscurities of counsel, and Mr. Holroyd's exposition of the subject strengthens in us that impression. The Judges have differed as to the accordance of the words used carelessly by patentees, with the meaning of the word "manufacture," but they have rarely differed in their estimate of whether the thing invented really was or was not a manufacture. The brief but pithy definition of the Court in the King *v.* Wheeler, (cited by Mr. Holroyd) is thus; "Something of a corporeal and substantial nature, something that can be made by man from the matters subjected to his art and skill, or at the least, some new mode of employing, practically, his art and skill, is requisite to satisfy this word (manufacture)." This idea is at the bottom of most of the opinions delivered by the Judges themselves.

But to resume our analysis, chapters 3 and 4 are "On the person to whom and for what time a patent may be granted." And on the forms of soliciting a patent and inrolling the specification. These chapters contain the rules of law and the official practice in such matters, the forms being given in an Appendix.

Chap. V. treats of a very important part of the law, viz. the patent and the denomination or title of the invention contained therein; the specification, and the rules of construction applicable to the patent and the specification. Mr. Holroyd has fully appreciated the importance of impressing upon his readers the law as to the denomination of the invention in the patent, and he cites abundance of cases which shew the absolute necessity, that the title or denomination should be strictly correct, expressing the invention neither more nor less than it really is; and that it "should state in substance what is set out in detail in the specification.

"If the patentee (he says, quoting the Court in Rex *v.* Wheeler) has not invented the matter or thing of which he represents himself to be the inventor, the consideration of the royal grant fails, and the grant consequently becomes void; and this will not be the less true, if it should happen that the patentee has invented some other matter or thing, of which upon a due examination thereof, he might have been entitled to a grant of the exclusive use."

And further, "A patent cannot extend beyond the consideration; and the consideration being entire, if it fail in any part, the patent is void *in toto.*

"If, therefore, a person applying for a patent state that he has discovered improvements in two things, and obtained a representation patent for two, and it should turn out that there is no novelty in one, the patent fails; and the reason is, that as the patentee claims the merit of having invented two things, the discovery of the two forms the entire united consideration for the grant, and the advisers of the Crown may think the two the proper subject for a patent, (the granting of which is matter of favour on the part of the Crown, although the thing be new in every particular,) when they might not have recommended the grant of a patent for each *per se.* The Crown is considered as deceived by the representation."

The operation of this extreme severity of the law as to the denomination of the invention and the accordance thereof with the specification, is very fatal to patentees, because it is often impossible for the utmost intellect and foresight, so to frame the denomination of an invention, at the time of applying for a patent, as to ensure that it shall exactly represent the invention, and that the specification shall exactly accord with it.* Nevertheless such is the law, and it is therefore very desirable that inventors and their advisers should be thoroughly imbued with the knowledge of it, for it is one of the points on which they are apt to be the most lax, imagining that they may give what title they please to an invention, and that they will be judged by the specification. On the specification Mr. Holroyd is equally sound and clear, and has shewn great judgment in his selection from the cases that he has brought to bear upon his explanations of the law; indeed the whole of this fifth chapter is admirably drawn up; it is however a melancholy catalogue of dangers for inventors, but for that very reason it should be carefully studied.

The remainder of the book is devoted to the consideration of the property in patents, viz., the assignment of a patent; the granting of licences, the extension of patents, the infringement of patents, the nature of evidence required and admitted on trials, on injunctions in equity, and repeal and surrender of a patent.

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* The origin of the law may be traced to an old Statute of 1 Henry IV., c. 6, which was made for patent grants of lands, and not at all for patents of invention. It is not wonderful that a law made for one thing, and applied to another, should oftentimes have a bad effect.

Much of this latter part is formal, and the remainder almost exclusively legal; hence not being ourselves lawyers, we hardly feel competent to pronounce decidedly upon its merits. We find in it however the same methodical arrangement of materials, and the same brevity and clearness of style which mark the former part of the work; and from the judgment and care with which Mr. Holroyd has executed that part, we should be induced to put confidence in the soundness of the remainder. The appendix contains various forms referred to in the body of the work, viz., the forms of soliciting a patent, the patent itself, specification, licence, form of petition for extension, &c. &c.

The chief characteristics of Mr. Holroyd's work are, method and condensation; hence without being voluminous, it contains a great quantity of information, and will prove, we doubt not, a valuable publication to students and inventors. We cannot however suffer the work to pass with our unqualified approbation. A decided want will be perceived at the end of each section, of a general summary, or definition of the law; a resolution of all the detached rules, drawn from particular decisions, into some fundamental rule or principle of judgment, which is at the root of them all, and is the essence and spirit of the law.

We are not aware that this has been done in any other treatise on the same subject, but that is a reason why Mr. Holroyd should have done it. It is true men of judgment can form conclusions for themselves, but Mr. Holroyd professes to write for the public, that is, inventors as well as lawyers, and the public does not consist generally of men capable of drawing accurate conclusions on such abstruse points as the laws of patents.

List of Patents,

Granted by the French Goverment between the 1*st of January, and* 31*st of March,* 1830.

To Messrs Gensse, Dunning, and Co. Amiens, for the manufacture of a new kind of cloth, called *drap d'Alep*. 5 years.

— Libel, Charles, Thomas, Upholsterer, Paris, for making gilt nails, called *sixtes*. 5 years.

— Bazy, Jean, Chemist, St. Omers, for making paper from the remains of the pulp of beet root. 5 years.

— Hall, Edward, Engineer, Paris, for a new method of fixing hydraulic wheels, applicable to water falls, variable in their level. 15 years.

— Ourselle and Roberts, Plaster Manufacturers, Pantin, near Paris, for a cast iron apparatus, applicable to ovens, built of common plaster. 10 years.

— Sorel, Watchmaker, and Gagneau, Lamp Manufacturer, Paris, for a constant level lamp, which is supplied with oil from below. 10 years.

— Brot, Alexandre, Cyrille, paper maker, and Stationer, for a port folio with inkstand. 5 years.

— Bellemére, Francois, Paris, for a cock for decanting liquids. 5 years.

— Dauptain, Son and Sister, paper stainers, Paris, for a method for making hot pressed papers. 5 years.

— Saint Martin, Jean Baptiste, Paris, for a machine for taking off the gloss from cloth and stuffs. 5 years.

— Eno. Salmon, and Yvart, Pavie and Jourdain, manufacturers, Paris, for a stuff for furniture, the pattern of which is on both sides of two different colours. 10 years.

— Lenoir, Barnabé Antoine, Paris, for a method of making, preserving, and transporting ice, and of applying it to several useful purposes. 10 years.

— Houeix, Jean Baptiste, Apothecary, Paris, for manufacturing white chocolate. 5 years.

— Houssard, Michel, Marie, Eugene Francois, Paris, for a machine for stamping copper kitchen utensils. 10 years.

— Carpentier, Antoine, Alfonse, straw hat manufacturer, Paris, for a new straw hat. 5 years.

— Duvergier, Anné and Bordége, Hilarion, engineers, and machinists, Paris, for a process, and apparatus, for drying in a short time timber for building and other objects. 15 years.

— Jaillet, Jeune, Claude, pattern drawer, Lyon, for a machine for making figured stuffs. 15 years.

— Brook, Jonas, manufacturer, Manchester, for a machine for spinning cotton, &c. 15 years.

To Cochaux, engineer and machinist, Liege, for an apparatus for preventing and even rendering impossible, the bursting of boilers of both high and low pressure. 15 years.

— Callier, Emmanuel, tinman and lamp manufacturer, Paris, for a lamp socket, with double air holes, or current of air. 5 years.

— Sterlin, Louis, Charles, ironmonger, Paris, for a new kind of lock. 10 years.

— Sainte, Chapelle, Jean Baptiste, Francois Pascal, Paris, for an hydraulic apparatus, called a *trombe d'Eau*. 10 years.

— Delarne, Jean Baptiste Edouard, Caen, for a syringe, *a ressorts*, with springs. 10 years.

— Richefew and Fleschelle, bakers, Paris, for a kneading machine. 15 years.

— Langlais Quignolot, purse manufacturer, Paris, for a new stitch in making purses, called the *Point de tulle* or *point a jour*, made by a machine. 5 years.

— Best, Constance, Paris, for an hydraulic engine. 15 years.

— Sterling Jeune, Francois, locksmith and mechanic, Bordeaux, for an improved locomotive power, applicable to navigation. 15 years.

— Hermann Stinnes, miller, Strasbourg, for a peculiar method of cutting the grooves in millstones, from the quarries of Andernach. 15 years.

— Serbat, Louis, chemist, Paris, for improvements in charcoal for sugar refiners. 15 years.

— Francfort, Theóphile, David, Paris for a method of flatting a mixture of brass and pewter, or bronze, and of employing sheets of bronze for sheathing ships. 16 years.

— Robert Alexis, coach builder, Paris, for a system of stage coaches, called *articulees*. 15 years.

— Coffin, Francois, mechanic, Boston, for a machine and the application of cutting instruments, called *helicoides*, for removing from the skins of animals the hair or fur for hat making. 10 years.

— Messrs Payen, Lecerf, and Didier, chemists, Greuelle, near Paris, for a new method of making animal black. 10 years.

— Maller, Guillaume, Paris, for an instrument, called a *cosmosphere*. 10 years.

— Courtet, Auguste, mechanic, Lyon, for a new method of glossing silks, stuffs, &c. called *crepage velu*. 10 years.

— Gougeon, Jacques César, bleacher, St. Didier, for a covered drying machine, for bleaching linen. 10 years.

— Rotch, Benjamin, Paris, for an economical method of making soap. 10 years.

— Lupé, Pierre Auguste, Paris, for a method of restoring to animal black which has been used in refining sugar its original qualities. 10 years.

— Nepveu, Augusta Nicolas, bookseller, Paris, for a panorama, called the *panorama de salon*. 5 years.

— Mijevre Verger, Jean Baptiste, physician, Marseille, for a process to be used instead of nut galls in dying. 5 years.

— Thomas, Augustin, Joseph Fortunee, horse hair stuff manufacturer, Paris, for a method of taking raised velvet drawings on horse hair stuffs, and straw. 5 years.

— Pingret, Joseph Amont, engraver, Paris, for a die, composed of several pieces of steel. 5 years.

— Langrenez, Augustine Louis, piano-forte maker, Paris, for improvement in pianos. 5 years.

— Chevalier Curt, Esprit, artificer in fireworks, Paris, for a portable cast iron furnace. 5 years.

— Messrs. Edward and Affre, Bordeaux, for a soap called Savon de Cachemire. 5 years.

— Paque, Jaques Francois, Etienne, apothecary, Orleans, for a method of keeping dry the teats of cows destined to rearing infants artificially. 5 years.

— Tremblot, Joseph Thomas, Paris, for a machine for making brass capsules in one piece, and several at once, for priming detonating guns, &c. 5 years.

— Conty, Alexandre, miller, La Haye Descartes, for a new hopper for flour mills. 5 years.

— Bowin, Jean, mechanic, St. Etienne, for a mechanical batten for making ribbons. 5 years.

— Anjard, Etienne, Paris, for a complete artificial head-dress, which may be kept on by means of springs and pins. 5 years.

— Roth, Louis, Paris, for a process and apparatus for preparing syrups without loss. 15 years.

— Josselin, Jean, Julien, laceman, for improvements in corsets, by means of which they may be laced or unlaced at pleasure, without aid. 5 years.

— Pionnier, coke manufacturer, Paris, for a process for preparing the stone for making plaster of Paris, by means of hydrogen gas, and other improvements. 15 years.

— Lahore, Jean, Baptiste, Paris, for a mechanical kneading machine, called *Lahorides*. 10 years.

— Guy, Brothers, Pierre Gabriel and Jean Pierre Ansalme, Paris, for a machine for making bread. 15 years.

— Monet, René, Paris, for an apparatus and process for making coke, preparing plaster of Paris, and making animal black and glass. 15 years.

— Lasgoseix, Etienne, engineer, Paris, for divers mechanical kneading troughs. 10 years.

To Papillon, Paris, for a method of public advertisements, by means of frames, &c. &c. 10 years.

— Newhaus Maison Neuve, Paris, for a mechanical apparatus for the use of bakers, called the *Petrisseur Automate*. 15 years.

— Ferry, Jean Nicholas, mechanic, Paris, for improvements in the *Quintenz* portable scales. 5 years.

— Ferraud, Pierre, Paris, for a mechanical kneading machine. 5 years.

— Messrs. Barth, Hardy, and Faveers, Paris, for a combination of springs, adapted to carriages, elastic beds, &c. 10 years.

— Benard, Nicholas Etienne, Paris, for an apparatus for evaporating liquids by steam. 5 years.

— Messrs. Blanc and Conville, Paris, for a method of raising or lowering water by means of steam engines, &c. 15 years.

— Blanchard Just. Louis, colour manufacturer, Paris, for a yellow, red, and brown colour, to replace those of Italy. 10 years.

— Boutigny, Antoine, apothecary, for a syringe, called *plongeante*. 5 years.

— Collier, John, engineer, Paris, for a machine for napping cloth. 5 years.

— Messrs. Drevon, Boudon, and Desboides, Paris, for a method of carbonizing turf. 5 years.

— Dumoutier, Bon. Pierre, lime manufacturer, Pantin, for a method of curing plaster of Paris with pit-coal. 5 years.

— Fortin, Pierre, distiller, Paris, for a digester and furnace, called *Hydraulique*, for cooking meat and vegetables. 10 years.

— Godin, Jean. Francois, manufacturer, Sceaux, for a travelling carriage, called a *messagerie economique*. 15 years.

— Guérin, Jeune, Pierre, merchant, Nismes, for a distilling apparatus. 10 years.

— Haentzens, merchant, Paris, for a machine called *porte-encre auxiliare, ou port couleur*, for applying ink mechanically to printing presses, and colour upon stuffs or paper, &c. 5 years.

— Joline Dubois, and Co. and Rony, Nantes, for reducing ivory black to its original state, after having been used in refining, and for carbonizing turf. 10 years.

— Martin, Emily, Smith, Fourchambault, for a smelting process. 10 years.

— Netster, Erneste Auguste, and Fromm, Frédéric, Strasbourg, for a tissue made from the stumps of feathers, for making hats, necklaces, bracelets, baskets, &c. 5 years.

— Neuville, André, Mechanic, Bordeaux, for a machine for putting in motion a carriage, boat, mill, &c. by the force of men or horses. 10 years.

— Renaud de Vilbach, Alfonse, Ernest, Bernard, Maximilian, Montpellier, for an iron rail-way. 15 years.

— Messrs. Seguin and Co. engineers, Lyon, for a new invention for boilers of steam engines, by means of isolated pipes, through which the steam is made to circulate. 15 years.

— Sirot, Son, nail maker, Valenciennes, for making zinc nails by machinery. 15 years.

— Talbot, Pierre Désiré, cloth manufacturer, Louviers, for a machine called *table hydromanostatique* and *manostatique*, for a new method of dressing cloth. 5 years.

— Tellier, Nérée, goldsmith, Paris, for an improved axle-tree, called *essieu Tellier*. 10 years.

— Tezier, Jaques François, Sorgues, for a spinning machine, and other improvements. 10 years.

— Triaux. Antoine, lamp manufacturer, Orleans, for a new synombra lamp, in which the oil is kept constantly on a level with the wick, by means of a piston, &c. 5 years.

— Accard, Stanislas, Paris, for a machine for making wire nails and tacks. 15 years,

— Chaussenot, Jaques Bernard, Chaillot, for an apparatus against smoking chimneys. 10 years.

— Chaussenot, Bernard, engineer and alliette, Paris, for improvements in lighting by oil. 10 years.

— Chrétien, Claude, and Sourd, Louis Charles, silk manufacturers, Lyon, for a machine for making ribbons, and larger plain stuffs. 5 years.

— Guibal and Ratier, Paris, merchants, for a method of reducing carst-chouc, or india-rubber, into threads, and making waterproof stuffs thereof. 15 years.

— Laroche, Philippe, Paris, for an economical cooking apparatus, called cuisine des Dames. 5 years.

— Morgan, William, London, for improvements in steam engines. 15 years.

— Mulot Louis George, mechanic, Epinay, for improvements in the method of adjusting iron pipes. 10 years.

— Pwquewr, Onésiphore, Paris, for improvements in steam engines. 15 years.

— Zeler, Potter, Près St. Gervais, for improvements in preparing plaster of Paris, by means of an oven, called *Zelerien*. 15 years.

— Wall, Jaques, Tinman, and Laveleye, Charles, engineer, Paris, for a new level lamp, called *lampe Chimique*. 10 years.

— Demarne, André Germain Victor, for improvements in stocks and shirt collars. 5 years.

To Ducret and Bouvet, Besançon, for a clock regulator. 5 years.

— Chauvin Chabot, Antoine, Emmanuel, Cæsar, of Mans, for an instrument for instantaneously loading fire-arms, called chargeoir accélére. 10 years.

— Adam, Gaspar, Zacharie, Montpellier, for a distilling apparatus. 15 years.

— Oilleaux Desormeaux, Paris, for a moveable vice, called in the trade *a genou.* 5 years.

— Pimont, Pierre Prosper, printed calico manufacturer, Darnetal, for a method of preparing dyed or undyed wool for spinning, without the aid of oil. 5 years.

New Patents Sealed, 1830.

To Robert Hicks, of Conduit Street, in the parish of Saint George Hanover Square, in the county of Middlesex, surgeon, for his having invented or found out an economical apparatus or machine, to be applied in the process of baking, for the purpose of saving materials.—Sealed 26th June, 6 months, for Inrolment.

To Edward Turner, of Gower Street, in the county of Middlesex, M. D. and William Shand, of the Burn, in Kincairdineshire, in that part of the United Kingdom, called Scotland, Esq. for their having invented a new method of purifying and whitening sugars, or other saccharine matter. 26th June, 6 months.

To Moses Poole, of Lincoln's Inn, gentleman, in consequence of a communication made to him by a certain foreigner residing abroad, for an invention of certain improvements, in the apparatus used for certain processes of extracting molasses or syrup from sugar.—26th June, 6 months.

To Samuel Parker, of Argyle Street, Oxford Street, in the county of Middlesex, bronzist, in consequence of a communication made to him by a certain foreigner residing abroad, and improvements made by himself, for an invention of certain improvements in producing mechanical power from chemical agents.—29th June, 6 months.

To Samuel Parker, of Argyle Street, Oxford Street, in the county of Middlesex, bronzist, in consequence of a communication made to him by a foreigner residing abroad, and improvements made by himself, for an invention of an improved lamp —1st July, 6 months.

To Richard Roberts, of Manchester, in the county of Lancaster, civil engineer, for his having invented or found out a certain improvement or certain improvements in the machinism employed to render self acting the machines known by the names of Mule, Billy, Jenny, Jack frame, or Stretching frame, and all other machines of that class, whether the said machines be used to rove slub, or spin cotton, or other fibrous substances.—1st July, 6 months.

To John Henry Clive, of Chell House, in the county of Stafford, Esq. for his having invented certain improvements in the construction of and machinery for locomotive ploughs, harrows, and other machines and carriages.—1st July, 6 months.

To John Harvey Sadler, of Praed Street, Paddington, in the county of Middlesex, engineer, for his having invented certain improvements in looms.—1st July, 6 months.

To Matthew Uzielli, of Clifton Street, Finsbury Square, in the county of Middlesex, gentleman, in consequence of a communication made to him by a certain foreigner residing abroad, for an invention of improvements in the preparation of certain metallic substances, and the application thereof to the sheathing of ships and other purposes. —6th July, 6 months.

To John Surman, of Hounslow Barracks, in the county of Middlesex, lieutenant and riding master, in the Tenth Hussars, for his having invented certain improvements on bits, for horses and other animals.—6th July, 2 months.

To William Wedd Tuxford, of Boston, in the county of Lincoln, miller, for his having invented a machine or apparatus for cleansing or purifying wheat, grain, or other substances.—6th July, 6 months.

To Edward Cowper, of Streatham Place, in the county of Surrey, and Ebenezer Cowper, of Suffolk Street, Pall Mall, East, Westminster, in the county of Middlesex, engineers, for their having invented certain improvements on printing machines.—19th July, 6 months.

To John Rawe, jun. of Albany Street, Regent Park, in the county of Middlesex, (being one of the people called Quakers,) and John Boase of the same place, gentleman, for their having invented certain improvements, in steam-carriages and in boilers, and a method of producing increase draft.—19th July, 6 months.

To Thomas Bulkeley, of Albany Street, Regent Park, in the county of Middlesex, M. D. for his having invented certain improvements in propelling vessels, which improvements are also applicable to other purposes.—19th July, 6 months.

To William Taylor, of Wednesbury, in the county of Stafford, engineer, for his having invented certain improvements on boilers and apparatus connected therewith, applicable to steam engines and other purposes.—19th July, 6 months.

To Edward Riley, of Skinner Street, Bishopsgate Street, in the county of Middlesex, brewer, for his having invented certain improvements in the process and apparatus for fermenting malt, and other liquors.—19th July, 6 months.

To George Oldland, of Hillsley, in the parish of Hawkesbury, in the county of Gloucester, clothworker, for his having invented or found out certain improvements in the machinery or apparatus for shearing and dressing woollen cloths and other fabrics.—22nd July, 6 months.

CELESTIAL PHENOMENA, FOR AUGUST, 1830.

D.	H.	M.	S.	
1	0	0	0	Clock before the ⊙ 6 *m* 1 Sec.
2	4	0	0	☽ in conj. with *d* in Sagett
4	0	57	0	Ecliptic opposition or ○ full moon.
5	0	0	0	Clock before the ⊙ 5 *m* 43 Sec.
6	1	0	0	☾ in conj. with λ in Aquarius
6	10	0	0	☾ in conj. with φ in Aquarius
8	9	0	0	♀ in conj. with ξ in Gemini
8	18	0	0	☿ in conj. with ♄. Long. 17° in Cancer. ☿ lat. 1° 45' N. ♄ lat. 1° 6' N. diff. of lat. 39'.
9	3	0	0	☾ in conj. with ν in Pisces
10	0	0	0	Clock before the ⊙ 5 *m* 7 Sec.
10	6	0	0	☾ in conj. with μ in Ceti
10	20	8	0	☾ in ▭ last quarter
11	2	0	0	☾ in conj. with f in Taurus
11	11	0	0	♀ in conj. with δ in Gemini
11	22	0	0	☾ in conj. with γ in Taurus
11	23	0	0	☾ in conj. with α in Leo
12	0	0	0	☾ in conj. with 1 δ in Taurus
12	0	0	0	☾ in conj. with 2 δ in Taurus
12	5	0	0	☾ in conj. with α in Taurus
15	0	0	0	Clock before the ⊙ 4 *m* 17 Sec.
15	10	0	0	☿ in conj. with ϱ in Leo
17	23	53	0	Eclip. conj. or ● new moon
18	0	0	0	♂ Stationary
18	18	0	0	☽ in conj. with ϱ in Leo
19	6	0	0	☽ in conj. with ☿ long. 12° in Leo ☽ lat. 0° 3' N. lat. 1° 7° N. diff. of lat 1° 4'
19	18	0	0	☽ in conj. with σ in Leo
20	0	0	0	Clock before the ⊙ 3 *m* 14 Sec.
20	9	0	0	☽ in conj. with β in Virgo
21	0	0	0	☽ in conj. with η in Virgo
21	11	0	0	☽ in conj. with 1 γ in Virgo
23	3	0	0	♀ in conj. with σ in Leo
23	5	7	0	⊙ enters Virgo
24	8	0	0	☿ in conj. with τ in Leo
25	0	0	0	Clock before the ⊙ 1 *m* 59 Sec.
25	6	0	0	☽ in conj. with γ in Libra
25	17	0	0	☽ in conj. with ψ in Libra
26	2	3	0	☽ in □ first quarter
26	9	0	0	☽ in conj. with φ in Oph
28	5	0	0	♀ in conj. with *d* in Cancer
28	8	0	0	♀ in conj. with β in Virgo
29	23	0	0	☽ in conj. with δ in Sagett
30	0	0	0	Clock before the ⊙ 34 sec.

The waxing moon ☽.—the waning moon ☾

Rotherhithe. J LEWTHWAITE.

METEOROLOGICAL JOURNAL, FOR JUNE AND JULY, 1830.

1830.	Them.		Barometer.		Rain in inches.
	Hig.	Low	High.	Low.	
JUNE					
26	76	55	29,72	29,63	
27	76	51	29,82	29,76	
28	72	52	29,84	29,79	
29	72	53	29,91	29,79	,025
30	68	42	29,99	29,96	
JULY					
1	71	47	29,91	29,76	
2	64	45	29,71	29,61	,45
3	64	51	29,64	29,46	,1
4	69	51	29,77	29,72	,15
5	70	47	29,96	29,86	,025
6	68	49	29,96	29,76	
7	64	55	29,61	29,56	
8	64	49	29,66	29,57	,025
9	63	45	29,54	29,41	
10	62	48	29,82	29,66	
11	65	42	29,82	29,63	
12	64	43	29,85	29,55	,075
13	71	41	30,09	30,05	,025
14	77	43	30,09	30,00	
15	74	45	29,94	Stat.	
16	68	49	29,96	29,94	
17	66	42	29,99	29,86	
18	63	56	29,81	29,76	,125
19	69	50	29,98	29,89	,425
20	67	51	30,05	30,04	
21	75	51	30,15	30,09	
22	74	55	30,16	30,14	
23	76	57	30,08	30,06	
24	77	60	30,06	30,01	
25	80	51	30,16	30,15	

EDMONTON. CHARLES H. ADAMS.

THE

London

JOURNAL OF ARTS AND SCIENCES.

No. XXX.

[SECOND SERIES.]

Recent Patents.

To Lemuel Wellman Wright, *of Upper Kennington-lane, in the county of Surry, Engineer, for his having invented certain improvements in the combination and arrangement of machinery for making metal screws.*—[Sealed 17th March, 1827.]

In the fourteenth vol. of our former Series, page 205, we noticed the ingenious machinery which forms the subject of this Patent, and intended to have given the details more at large in a subsequent report (with a Plate exhibiting the machinery.) We find, however, that the several figures of the drawings accompanying the specification are in many parts so extremely minute, as to render such reductions of them as would come within the compass of our volumes perfectly unintelligible, we can therefore only give such a general description of the whole as will point out the leading features of the invention.

The design of this machinery is to form screws of all sizes and kinds, but particularly those with open threads, usually known by the name of wood screws. The machines for making these screws are of two characters. The first is for drawing in certain lengths of iron or other metallic wire, which, by a peculiar construction of shears, is cut off into suitable lengths for the shafts of the intended screws; and each shaft being tightly held between dies, is compressed at the end by a powerful punch applied against it, which forces a portion of the metal into the die, and forms the perfect head of the intended screw. The second construction of machine is designed to receive the shafts at the time when the nicks or slits in the heads are to be cut in each of them; and in the same machine the thread or worm is produced round the shaft, by a turning process.

Referring to the report above mentioned, in Vol. XIV. embracing a more minute detail of the construction, we give this general outline of the invention, as a prelude to the following Patent, which is a further improvement upon the above machinery for making screws.—[*Inrolled in the Inrolment Office, Sept.* 1827.]

To LEMUEL WELLMAN WRIGHT, *of Mansfield-street, Borough Road, in the county of Surry, Engineer, for his having invented certain improvements in machinery for making screws.*—[Sealed 18th September, 1828.]

THE invention specified under this Patent is, as we have above stated, for improvements upon the preceding, and consists of two separate machines, as in the first instance, varied from the former, not in principle, but in such of the minor details as experiment proved to be necessary, and which ought to have been added to the former Patent as improvements essential to its perfection, without putting the Patentee to the enormous expense of new patents for the three kingdoms. This grievance we hope will be corrected under the proposed revision of our Patent Laws.

The first part of these improvements is described as a machine of nearly similar form and construction to the former for cutting off the required lengths of wire, and heading the shafts of the intended screws, but differing in its detail; the principal features of novelty being, 1st, the application of toggle joints acted upon by cams fixed upon rotatory shafts above and below, for the purpose of forcing forward the punch which compresses the end of the shaft into the die for forming the head; and bringing the punch back again; and at the same time feeding in the wire. 2d, the mode of moving the cutter for cutting off the required length of wire for each shaft; and, 3d, the novel arrangement of the general detail of the parts of the machine.

Fig. 1, Plate XII, is a side view of the machine, which will sufficiently exhibit the operations of the several parts; *a, a, a,* is the frame work or standards, upon which the working parts of the machine are mounted; *b,* is the first or driving shaft, on which a rigger is placed, connected by a band to any first mover, and communicates with the main shaft *c,* by a wheel and pinion. Upon this main shaft *c,* the main cam *d,* is fixed; *e,* is another shaft, driven by spur gear from the main shaft *c,* upon which the secondary cam *f,* is mounted, for raising the toggle joints *g, g,* after they have been depressed by the rotation of the main cam *d,* and have forced forward the punch bar *h,* and punch *i,* into the cup or die *j,* where the end of the wire shaft is compressed to form the head.

The wire is brought into the machine from the opposite end by the feeding chaps or fingers *k*, which are connected to the punch bar *h*, by straps *l*; and as they slide backwards and forwards, the same movement is communicated to the feeding chaps which slide on their supports, and are so constructed as to close upon the wire in coming towards the machine, and in returning to open. The piece of wire shewn in the chaps is placed on a feeding board or table, and held by a pair of spring fingers.

Supposing the wire to be brought into the dies which have been previously opened, the cam *m*, on the main shaft as it revolves, forcing the longer end of the lever *n*, depresses its shorter end of the lever, and also the piece *p*, in which the upper half of the dies *j*, are mounted, and thus closes them, and the wire is by that means held firmly in the dies.

The rotation of the shaft *f*, being simultaneous with the main shaft, the double or grooved cam *q*, *q*, will raise the longer end of the lever *r*, which has its fulcrum at *s*, and depress the shorter end, and with it the cutter plate and cutter *t*, shewn by dots; and as the cutter passes the end of the die, it will separate that portion of the wire which is to form the shaft held in the die from the length of wire drawn in. The shaft is now ready to be compressed at the end of the punch, for the purpose of producing the head of the screw.

The cutter plate is formed of steel, and has a small hole through it, into which the end of the wire is forced; the other part of the plate being perfectly flat and smooth, forms a bearing for the end of the wire in the die.

The main cam *d*, having forced down the toggle joints, as shewn in the figure, the bar will be advanced, and with it the punch, which acting against the end of the screw shaft, will press the wire into the cup of the die, and form the head.

The rotation of all the shafts and cams being continued, the cam *d*, will pass away from the friction roller in the toggle joints, and allow the secondary cam *e*, now to act upon the friction roller, and force up the toggle joints into the position shewn by dots, which movement will draw back the punch bar, and with it the feeding pincers, which now takes hold of another length of wire, and brings it into the machine, displacing the previously headed shaft.

During the time that the feeding chaps or fingers are closing upon the wire, the rotation of the double cam *q*, will have depressed the longer end of the lever, and forced up the cutter plate into its former position, that is with the hole opposite the end of the die, and the cam *m*, on the main shaft, allowing the end of the lever *n*, to drop upon its smaller diameter, it raises the piece *p*, in which the upper half of the dies are mounted. It is this movement that releases the shaft from the dies by opening them, and allows the next length of wire to be introduced by the feeding pincers, which bring another length of wire into the dies. As the punch recedes, a pair of spring clips or fingers are moved laterally across the machine fixed on the sliding bar *u*, which is put in motion by a lever and double cam on the end of the main shaft. The screw shaft is taken by these fingers to a stationary bearing in the middle of the machine, where it is held by a chap and lever, acted upon by a small cam on the secondary shaft *f*, until the next movement of the fingers fetch another screw shaft, when the fingers leave this screw shaft, and it is then taken hold of by another pair, and carried to a second heading die, where the heading of the screw is finished.

At the second heading die there is a similar arrangement of nearly all the parts, as in the first; the same movements being required at the second operation upon the head, excepting the cutting off of the wire; and the opening and shutting of the die, which die is made in one piece.

The straps used in the first operation for bringing in the wire, are connected to a sliding rod in the same situation as the feeding apparatus, which forces out the screw shaft, after being operated upon by the second punch, when it is taken hold of by a third pair of spring fingers, and carried to another bearing, where it is held by another lever and chap, acted upon by a cam on the secondary shaft. The screw shaft is held in this situation for the purpose of bringing a turning apparatus to act upon the head, to remove any roughness or burr on the edge of the head, and to render the head truly concentric with the shaft.

This turning apparatus consists of a cutter mounted on a revolving shaft, placed within a tube, to which it is connected by a slot and key, so that they may revolve together; but the shaft has a sliding movement within the tube, the tube being kept by its bearings in its proper situation. Upon this tube is mounted a small rigger, which receives its motion by a band passing over guide-pullies to a large rigger or pulley on the first shaft. The end of the revolving shaft projects out of the tube, and is kept by a helical spring, coiled round it against the end of a sliding bar, acted upon by the cam on the secondary shaft; and on a screw shaft being placed upon the bearing, and held by the chaps and lever, the cams push forward the sliding bar, and with it the shaft, carrying the cutter up to the head of the screw shaft, and as it revolves, cuts away all roughness round the edge of the head.

After this is completed, the cam allows the sliding bar, and also the shaft and cutter to be drawn away from the head, by the helical spring, when the cam on the secondary shaft, ceasing to act on the lever which holds the screw during the last operation, the now finished screw shaft is released and allowed to fall down below, it having been displaced by the third pair of fingers on their bringing another shaft to have a similar operation performed on it.

The second machine by which the notches in the heads of the screws are cut, and the thread or worming formed on the shaft, is also similar in its principles of action to the former machine, but differing considerably in the detail. The leading novelties are, 1st, that the cutter which forms the notch in the head, has a rising motion at the same time that it revolves, passing gradually up, and cutting its way to the proper depth through the head as it rises, instead of coming into contact with the head in a line with its centre as in the former machine., 2nd, in dispensing with the fingers, used in the former machine for carrying the screw shafts from one part of the machine to another, where the different operations of slitting the head and cutting the thread, when performed by the substitution of a tube, through which the screw shafts are pushed after having been notched in the head, and projected into a pair of revolving chaps, which hold the shaft while the thread or worming is made upon it. 3rd, the screw shaft, which has a reciprocating rotatory, as well as an advancing and retiring motion communicated to it during the operation

The reciprocating rotatory motion given to the shaft, is by a rack and pinion actuated by a crank and lever, and the advancing and retiring motion is effected by a leading screw, upon which depends the rake or obliquity of the thread of the screw made by this machine. 4th, the screwing dies are mounted on levers, on a vertical stationary plate, and are made to close upon the shaft by the power of helical springs.

Fig. 2, is a section taken through the centre of the machine last alluded to, which will sufficiently show the arrangements of the parts and their operations; *a, a, a,* is the frame and stand, and upon which all the working parts are mounted; *b,* is the main shaft, having the cams upon it which put the parts in operation; *c,* is the driving and crank shaft of the machine, to which the fly wheel, rigger and band are attached, and this is connected to the main shaft by a wheel and pinion shewn on the further side of the machine.

The screw shafts, previously perfected by the first described machine, are now brought to this, and by the boy attending it are severally placed in a novel kind of feeding wheel *d,* which has round its periphery a number of teeth like a ratchet wheel, and in each of these teeth, there is a notch or groove, into which the ends of the screw shafts are to be put, as at 1, 2, 3, 4, 5, where they are held by slight springs pressing upon them, as shewn in the figure. This feeding wheel is mounted upon a horizontal shaft, turning upon bearings, and has also upon it a ratchet wheel *e,* having twice as many teeth in its periphery as there are notches in the feeding wheel. The movement of this ratchet wheel is effected in the following manner:—

Upon the main shaft *b,* is fixed the cam *f,* which acts upon the friction roller, on the end of the weighted lever *g;* at the other end of this lever there is a spring tooth, which takes into the teeth of the ratchet wheel, and as the cam *f,* revolves, it raises the lever and depresses the spring tooth, and carries with it one tooth of the ratchet wheel; this movement takes place twice during one revolution of the main shaft and a succession of such movements, will turn the feeding wheel at intervals, and bring the several screw shafts into the situation of 4, viz. into the mouth of a pair of holding pincers or chaps *g*, previously opened to receive them, and also opposite the mouth of the stationary tube before mentioned.

When the movement of the feeding wheel has brought the screw shaft into this situation, a cam *h*, on the main axle acts on the friction roller at the louger end of the lever *i*, and by depressing this end of the lever, raises the shorter end, and with it a pair of toggle joints connected thereto, at their central union joint; the ends of which toggle pieces are attached by joints to the extremities of the legs of the holding pincers, and on the lever rising and bringing the toggle pieces straight, the legs of the pincers become expanded, and the chaps made to take fast hold of the screw shaft, where they confine it, during the operation of forming the slit in the head.

The shaft being held in this position, the cutter *j*, is made to rise by the cam *k*, on the main shaft acting upon the longer end of the bent lever *l*; the cutter *j*, is mounted on a small axle, turning in, bearing in the forked or short end of the lever *l*, and rotatory motion is communicated to it by a band *m*, passing over a pulley on the same axle, and a large rigger or pulley *n*, on the crank shaft *c*.

It will be seen that as the cutter rises, it will pass through a part of the head, cutting it's way and forming the slit; and as soon as this is performed, the cam *k*, ceases to act on the lever *l*, and allows the cutter to be pulled down into its former position by the helical spring *o*.

The operation of slitting the head being completed, the holding chaps are allowed to open a little by the smaller diameter of the cam *h*, coming in contact with the friction roller on the end of the lever *i*, the other end of the lever with the toggle joints being pulled down by the spring *p*. At this time a cam *q*, upon the main shaft pushes forward a sliding bar *r*, with the punch *s*, against the head of the screw shaft, and forces it out through the chaps into the mouth of the tube *t*, *t*, in the position of the shaft 6, the holding chaps opening more widely as the head of the screw shaft advances towards them. On the screw reaching the position of 5, in the tube, it is held there by a pair of spring fingers.

These movements of the machine continuing as described, the shaft will be pushed forward at intervals, as additional shafts are introduced into the tube, until it reaches the position of the shaft 16.

Circumscribing the stationary tube *t*, *t*, is the revolving tube *v*, turning in bearings in the standards. On one end of this tube the sliding chaps *w*, *w*, are mounted, which hold the screw shaft while the worm or thread is cut upon its periphery. On the next movement of the machine, the screw shaft will be pushed out of the position 16, in the stationary tube to the position 17, in the mouth of the chaps *w*, which are then made to take fast hold of the screw shaft. This is effected by the depression of the shorter ends of the levers *x*, *x*, which are acted upon by the toggle joints *y*, *y*, brought into the position shewn in the figure by the movement of the clutch box *z*, *z*, to which these toggle pieces are jointed.

The movement of this clutch box *z*, is effected by another part of the machine not shewn in the figure, but will be understood by the following description:—On the ends of a forked lever 18, 18, are friction rollers, working in the groove of the clutch box; this lever lies horizontally across the machine, and the other end of the lever works on a pin as its fulcrum at the side of one of the standards of the machine. To this lever is connected one end of a long sliding bar, extending the whole length of the machine, and bent in a semi-circular form under the main shaft, so as to allow of two small cams, which act upon two friction rollers on the side of the bar, to revolve freely without touching it. One of these friction rollers are placed in front of the main shaft, and the other at the back, and as the cams revolve, they alternately push forward the sliding bar, and with it the lever *y, y,* and clutch box *z, z,* into the position shewn in the figure, and close the chaps upon the screw shaft. The other friction roller is for drawing back the bar, lever, and clutch box, and opening the chaps *w, w.*

The screw shaft 17, being now firmly held in the chaps, we will proceed to describe the operation of cutting the worm or thread round the screw shaft. The dies or stocks 19, which cut or form the thread upon the shaft, are mounted in legs or levers 20, 20, which move on pins in the vertical plate or standard, and are made to close upon the screw shaft by the power of a helical spring 21, or springs connected to both of the legs, which draw them together, closing the screwing dies upon the shaft as they form the thread.

In order to form the thread or worm properly, it is necessary to give the shaft a reciprocating rotatory motion; this is done by the crank 22, on the shaft *c,* which is connected by the rod 23, to the lever 24, having its fulcrum in the rocking crutch 25, the longer end of which lever is connected by a joint to the vertical rack 26, and this rack takes into a pinion 27, on the revolving tube *v.* This pinion is connected to the tube by a key and slot, so as to allow the tube to have a backward and forward motion, while the pinion remains confined in its proper place in gear with the rack, by a stationary bridle piece, embracing a groove in the pinion 27.

It will be seen that as the crank revolves, the rack will alternately be raised, and depressed, by the lever; and in order that the rack may be kept in gear with the pinion, there is a friction roller 28, on the joint of the lever and rack, which works in a parallel motion or guides 29, 29, the rocking crutch carrying the fulcrum of the lever, and accommodating itself to the motion of the crank and lever.

On the end of the rotatory tube the leading screw 30, is fixed, taking into a stationary female screw 31, fixed on one of the cross bearers of the machine. Upon this screw depends the backward and forward motion of the tube, and the rake or obliquity of the thread to be cut upon the screw shaft.

The operation of cutting the thread having been performed, a cam 32, on the main shaft, depressing the longer end of the lever 33, and causes the other end to be raised, and by means of a pair of toggle joints connected to this end by a centre sliding piece, to force apart the legs or levers, in which the screwing dies are mounted, and release the now forward screw from this pressure; at which moment the clutch box *z*, is moved back in the way before stated, and the screw released from the revolving sliding chaps *w*, *w*.

At this time a pair of carrying fingers 34, fixed on the end of a sliding bar, are brought forward by the movement of a long bar extending from the main shaft; these fingers are brought in by a helical spring, and made to lay hold of the now finished screw; the continued movement of the main shaft causes a cam to act on this long bar, and move it the reverse way, and carry back the fingers, and in them the screw, which as it recedes from the machine, meets with a projecting stud 35, by which the screw is forced out of the fingers, and falls away below into a basket, placed to receive them.

The cutting or screwing dies or stocks are to be well supplied with anti-attrition liquid from a vessel above, for the purpose of keeping the dies cool when cutting the thread on the shaft, and which greatly assists the performance of this part of the operation.

The Patentee considers that instead of the last described machine, it may be desirable, under some circumstances, to employ machines which perform the operation of cutting the thread or worming on the screw shaft only, and in that case proposes slitting the heads in a separate machine, by which he dispenses with in this machine the whole of the parts belonging to the slitting operation, excepting a pair of holding chaps at the end of the stationary tube, which are necessary to receive the shafts from the feeding wheel, and also serve as guides for the screw shaft, when forced into the tube by the punch.

The pair of holding chaps in this machine are two levers suspended on a vertical plate, from pins as their fulcrums, and have the holding chaps between them, which are brought together by a helical spring connected at its ends to the extremities of the levers. As the punch advances to push the screw shaft into the tube or wedge-formed piece on the under side of the punch bar, it forces apart the legs or levers, and opens the chaps, allowing the punch to push the shaft through them into the tube. In all other respects, this machine is the same as that last mentioned, but of course more simple in its construction.

The Patentee describes very minutely the detail of the fitting up of the several parts of the machine, and particularly the mode of mounting the screwing dies on their vertical plate; these dies may be mounted in their legs or levers; but he states in his specification that they are better fitted into sliding pieces, working in guides on the plate, and connected by pins to the legs of the levers, as being more steady than when fixed to the legs themselves, and that instead of the toggle joints on the end of the lever, the screwing dies may be opened by a wedge-formed piece on its end, forcing apart the legs and drawing open the dies.

[*Inrolled in the Roll's Chapel Office, March,* 1829.]

To John George, *of Chancery Lane, in the county of Middlesex, Esq. Barrister at Law, for his having found out or discovered an invention for preserving decked ships or vessels, so as to render them less liable to dry rot; and for preserving goods on board such ships and vessels from damage by heat.*—[Sealed 18th December, 1827.]

It is considered by the Patentee, that the general cause of what is called dry rot in timber arises from the timbers being exposed to very different degrees of temperature acting upon different parts of their surfaces at the same time; his object, therefore, is to effect a more perfect ventilation on ship board than the present construction of vessels will admit of.

It is assumed that the confined heat within the vessel makes its escape into the colder medium, partly by passing through the solid timbers and other wood work, and in so doing produces the approximate, if not the immediate cause of decay; to prevent this the Patentee proposes to place a perpendicular, hollow shaft from the lower part of the hull up to the deck, through which cold air is to be passed, and collateral tubes are to be branched off rom this main tube, extending to different parts of the vessel, with orifices in them, furnished with valves for the discharge of the air; and sliders are to be made within the tubes in several places, for contracting the passages and regulating the quantity of air passed. Apertures are to be formed in different parts of the vessel, to receive the cold air, and tubes with valves made to extend therefrom, for the purpose of carrying off the hot air.

At the top of the shaft a moveable head is to be attached, with shutters capable of opening to admit the air, and that is to be done on the windward side of the vessel; but the quantity of wind admitted may be regulated by opening more or less of the shutters both on the windward and leeward sides.

The hot air is to be expelled from the different parts of the vessel by the superior pressure of the cold air passed down the perpendicular shaft; and the exit apertures are to be closed by very light valves, proposed to be made of writing paper.

These valves are to be constructed by cutting out several circular pieces of paper one smaller than the other, and attaching them together, for the purpose of giving stiffness, by a pin passed through the centre.

The mode of ventilation above proposed for the preservation of timbers from dry rot is also applied to cooling the hold of the vessel, in order to prevent the merchandize and other goods on board being injured by the confined and heated air. It is also proposed to place leather hose, with the lower open end in the part or recess of the hold, from whence any confined air or gas is to be drawn; and the reverse end of the hose is to be attached to a pump, or some other exhausting apparatus, in order to draw the air out.

It appears unnecessary to extend our explanation of this invention further, as the Patentee's intention must be perfectly obvious. We regret, however, that we are unable to discover any originality of invention in this mode of ventilating, or ingenuity of contrivance in adapting it; but we are not prepared to say the same of the specification, for with such slender materials as those which constitute the subject of the patent, it is truly astonishing to see with what ingenuity, aided no doubt by study and deep legal knowledge, the Patentee has invented and brought on to fair parchment no less than *a hundred and ten Chancery folios* of written description, philosophical discussion, and legal comment bearing upon this subject, which constitute the matter of the elaborate specification now before us.—[*Inrolled in the Inrolment Office, June,* 1828.]

To CHARLES BROOK, *of Meltham Mills, near Huddersfield, in the county of York, Cotton Spinner, for his having invented certain improvements in machinery for spinning cotton and other fibrous substances.*—[Sealed 4th June, 1829.]

THE object of this invention is to keep the loose fibres on the outside of cotton yarn, or other fibrous materials intended to be spun in a throstle frame, as close as possible, in order to render the yarn or thread when spun smooth on its outside. This is purposed to be effected by passing the yarn over a roller, which is partially immersed in a trough of water.

The new contrivance is shewn in connection with the working parts of an ordinary throstle frame, in Plate XIII, in which the same letters refer to similar parts of the machinery in the several figures, which are thus described by the Patentee.

" Fig. 6, represents a front view of part of an ordinary spinning frame called a throstle, with my improvement applied to it. In this view only part of the machine is shewn, the remainder being similar, and the part shewn sufficient to explain the action and nature of my invention. Fig. 7, is a transverse section of the same machine, and fig. 8, a plan of the part shewn in fig. 6.

"In these figures *a,* represents fast and loose pullies, which are driven by a strap in the ordinary manner; *b, c, d,* and *e,* are successive wheels for conveying the motion to the wheel *f,* which is placed on the front roller shaft, from which the other rollers receive the differential motion, for the purpose of drawing the roving.

"In fig. 7, these wheels, *a, b, c, d,* and *f,* are shewn at their pitch lines only; and my reason for describing them here, or inserting them in the drawings, is to shew more clearly the exact position or part of the machine at which I apply my improvement.

"Before I proceed to describe the way in which my improvement is effected, I shall state the object and nature of the improvement, which consists in producing a much smoother thread or yarn than is produced by the ordinary process. This I effect by passing each thread or yarn over a revolving cylinder during its passage or transit from the front or delivering roller to the flyer of the bobbin.

"These revolving cylinders, over which the respective ends of thread or yarn are passed, are marked *g,* in the figures, and will be seen most clearly at fig. 8. The cylinders marked *g,* are supported on an horizontal shaft, which receives motion from the front roller shaft by means of the spur wheels *h,* and *i,* which gear into each other, and carry the shaft on which the cylinders *g,* are supported in an opposite direction to the revolution of the front roller, as shewn by the arrow in fig. 7.

"Beneath the cylinder *g,* is placed a trough *k,* which contains water, which the cylinders are partly immersed in, so that by their continuous revolution the upper part of their surface over which the thread or yarn passes in its passage or transit from the front roller to the flyer of the bobbin is kept constantly wet, the consequence of which is that the motion of the yarn or thread from the front or delivering roller to the bobbin being opposite to the direction of revolution of the cylinders marked *g*, loose fibres, which otherwise would stand off, are incorporated into the thread or yarn, and the twisting proceeding at the same time unites them into its substance, instead of allowing them to stand off.

" On referring to fig. 7, it will be seen that the cylinder *g*, over which the thread or yarn passes in its passage from the front or delivering roller to the flyer of the bobbin, presses the thread or yarn a little out of the straight line, which is required to produce the effect of incorporating the loose fibres into the thread or yarn as already described.

" This pressure is regulated by set screws seen at *m*, which, being connected with the steps or supports in which the shaft carrying the cylinders *g*, revolve, enables the operator to adjust the position of the cylinders as required.

" At the back of the cylinders *g*, and immediately beneath the front roller is placed a revolving shaft *l*, which also receives motion from the front roller by means of spur wheels. This shaft *l*, extends the whole length of the drawing rollers, and is covered with woollen cloth, for the purpose of taking up any ends of yarn which may break. Thus, supposing any one of the ends of yarn or thread to break between the front roller and the bobbin, the roving which would continue to be delivered from the front roller would necessarily fall on the covered shaft *l*, and adhering to the woollen surface, be wound or taken up by its revolution, and thereby be prevented from interfering with any other part of the machine.

" This shaft *l*, and its property of taking up any broken ends that may occur, I name as a useful application, but do not in any way claim it as part of my invention.

" Having described my improvement in machinery for spinning cotton and other fibrous substances, I declare that I do not claim any of the well-known portions or parts of the machine hereinbefore described, such parts having been named to make the description and nature of my invention more clear; but I do claim that arrangement of parts described at the letters *g*, *h*, *i*, *k*, and *m*, which consists of a revolving cylinder or cylinders introduced between the front or delivering rollers, and the cop or bobbin of a spinning machine, for the purpose of pressing against the thread or yarn, which, in conjunction with the water received on to its surface from the trough *k*, below, produces the effect already described.

" And I further declare, that my improvements may be modified and varied by driving the cylinders *g*, in an opposite direction, or from other parts of the machine than that from which I have driven them, as well as by the application of bands and pullies instead of wheels, for the purpose of revolving the cylinders, all which well-known modifications and variations, together with the proportions of the different parts, as well as the material to be used in constructing those parts, may be attained with facility by any person of competent skill, and fit to be intrusted with the direction and construction of machinery of this and a like description.—[*Inrolled in the Inrolment Office, December*, 1829.]

To Lambert Dexter, *of King's Arms Yard, Coleman-street, in the city of London, Esq. in consequence of a communication made to him by a certain foreigner residing abroad, for an invention of certain improvements in machinery for the purpose of spinning wool, cotton and other fibrous substances.*—[Sealed 16th June, 1827.]

These improvements consist in the adaptation of a peculiar construction of flyers to a spinning machine, by which the threads or yarns are wound upon the bobbins; and also in the introduction of rollers, which pinch the threads and hold them while they are twisted and wound.

The specification does not explain the invention in very clear terms; but we have endeavoured to supply the defects from our own knowledge of the invention, occasionally introducing the Patentee's own words, which are merely descriptions of the several figures, as represented in Plate XIII.

Figures 1, 2, and 5, are vertical elevations, shewing the improvements adapted to the spinning frame. Fig. 3, is a vertical section of the improved part detached; and fig. 4, is a horizontal representation of the upper part of fig. 3; both of these last-mentioned figures being drawn upon a scale three times the size of the former: the similar letters of reference pointing out the same parts of the machinery in all the figures.

In fig. 1, a, is the driving rigger of the machine, to which the moving power is applied by an endless strap; and b, is the loose rigger on the same axis, to carry the endless strap when the machinery is required to be at rest.

c, is a toothed wheel, fixed on the horizontal axle of a, to drive the toothed wheel d, which is fixed at the end of another horizontal axle, extending across the machine, having a bevil wheel E, and a worm, *a*, at its other end. The wheel E, drives a similar bevil wheel, fixed at the lower end of an oblique axle F, which has another bevil wheel at its upper end, intended to drive the wheel G, fixed at the end of the axle of the metal rollers H.

Bearing upon the rollers H, are the other metal rollers I, covered with leather, which turn in open bearings, and are pressed down by the springs K, screwed on the top of the cast iron frame L. The supports of the rollers H, & I, are fixed to the top of the frame L, by the screws M.

N, and O, are two horizontal cast iron rails, reaching from one end of the machine to the other. The ends of these rails are fixed by screws to the end frames L, and to them are attached the upper and lower carriages P. & Q.

The worm *a*, at the extremity of the axis of the bevil wheel E, drives the worm wheel fixed to the upper end of the oblique axle R, which axle having a bevil wheel at its lower end, drives the wheel S, on the horizontal axle T.

On the axle T, the heart-shaped cams or excentries U, are fixed, which act against the extremities of the levers V, turning upon fulcrums W, at each end of the machine. The other extremities of these levers V, raise the horizontal sliding rail X, which is guided in its ascent and descent by rods Y, moving in guides fixed at each end of the machine to the frames L. This movement of the rail X, is for the purpose of raising and lowering the spindles *b*, which slide through the pullies *e*, and carry the bobbins *c*.

An endless line *d*, passes round a pulley fixed on the axle of O, for the purpose of driving the pulley *e*, and with it the twisting flyer *f*, *f*, which are connected together by a small pin; both *e*, and *f*, turn round on a vertical cannon or pipe fixed in the arm Q. Another endless line *i*, passes round a pulley fixed in the axle of D, for the purpose of driving the pulley *k*, and the drawing flyer *m*, which are made to revolve together by means of a connecting pin; these turn on pipes or cannons at the extremities of P.

Connected to each of the drawing flyers *m*, there are two horizontal metal rollers *n*, and *o*, the former of which is covered with leather, the latter plain or fluted; their bearings are in the frame *m*, and their contact is adjusted by a spring *q*.

A worm wheel *p*, is fixed on the axle of *o*, and as this wheel is carried round by the revolution of the flyer, its teeth take into the inner edge of a concave worm, or spirally twisted ring *r*, held by a stem *s*, which stem is screwed into the frame of the machine.

The obliquities of the spiral edge or concave worm within which the frame *m*, with its rollers revolves, must be adapted to the number of teeth in the worm wheel *p*; and for the purpose of varying the obliquity of the concave worm, the block *t*, may be made of any required thickness, and the edges brought closer together by a screw.

The wheel *p*, escapes one tooth at every revolution of the drawing flyer *m*, by which means the rollers *m*, and *o*, are made to revolve, and the fibrous substance is drawn forward and held between the two rollers, while it is twisted by the rotation of the flyer *m*.

The Patentee says, "this is a new and most important part of the machinery. The fibrous substance to be spun, wool for instance, is first to be passed between the feeding or drawing rollers H, I, then between the rollers *n*, *o*, in the drawing flyer *m*, and afterwards through the top of the twisting flyer *f*, through the loops *h*, *h*, fixed to *f*, and lastly is to be attached to the bobbin *c*; the wheel D, being twice the diameter of the wheel C, causes the drawing flyer *m*, to revolve with less than half the velocity of the twisting flyer *f*, which is necessary, in order to give sufficient twist to the thread or yarn *w*.

" These rotative velocities of the flyers will require varying for different fibrous substances, and according to the views and intentions of the manufacturer. The action of the heart-shaped excentric U, on one end of the lever V, causes the bobbin *c*, to rise and fall in such a way as to wind up the thread or yarn upon it in a regular and advantageous manner.

" The spindle *b*, does not revolve, being fitted tight into a round hole in the brass step on the moveable rail X; the thread or yarn is wound upon the bobbin *c*, sufficiently tight, in consequence of the friction between the bottom of the bobbin and the brass collar which is fixed on the spindle.

" Fig. 5, represents another method of moving the rail X, and the spindles *b*, for the purpose of winding cops or bobbins ready for use in weavers' shuttles; *x*, is a spiral cam wheel with its teeth downward fixed on a vertical axle 2, on which is also fixed the worm wheel *y*, driven by the worm *z*, which said worm may be placed on the middle of the length of the horizontal axle of the wheel, instead of using the heart-shaped excentric U; 3, is a lever of which there are two alike, one near each end of the machine connected together by a horizontal rail, which has in the middle of its length a tongue 5, bearing always against the teeth of the wheel *x*; the fulcrum of the two levers is at 4; a line 6, passes over a fixed pulley 7, and has one end fastened to the long arm of the lever 3, and the other end fastened to the rail *x*.

" The rise of the teeth of the wheel *x*, and the relative lengths of the arms of the said levers are so proportioned as to raise the bobbin 9, just the height required. The weight 10, suspended from each lever is a counterpoise to the rail x, and its cord, and is to be sufficiently heavy to make the tongue 5, always bear against the wheel *x*.

"To use this patent machinery in combination with any other machines now employed in preparing fibrous substances for spinning, all that is necessary is to bring the said substance from such preparing machine to a pair of horizontal rollers similar to H, I, placed at any convenient distance above the drawing flyer *m*.

"I do not claim as new in this kingdom, any parts of the machinery herein specified, taken separately, but I claim the specified machinery as a whole, as a new and valuable combination not hitherto known, and used in this kingdom for the specified purpose."

[*Inrolled in the Inrolment Office, December,* 1827.]

To JOHN MARSHALL, *of Southampton-street, Strand, in the county of Middlesex, Tea-dealer, for his new invented method of preparing or making an extract from cocoa, which he demominates Marshall's Extract of Cocoa.*—[Sealed 10th December, 1829.]

THIS is a mode of preparing cocoa differing from that commonly practised, but how far the product is better than the usually prepared cocoa (called Patent), of the shops, we are unable to state, as the present Patentee has not set out in his specification the particular advantages of his improvement, nor in the particular features of novelty which he proposes to claim.

The method of preparing, and the proportions of the materials are these:—Take about one pound of cocoa, either the Caraccas or Trinidad Nut is to be preferred, and having ground it, mix it with about a gallon of pure water. Let them boil together for the space of about one hour, and after skimming off the oil and scum very completely, pass it through a strainer of fine wires or horse hair, to prevent any lumps or extraneous matters from remaining in it.

This liquor, which is a strong decoction of cocoa, is now to be placed in an open dish or shallow vessel, immersed in a steam or hot water bath, not over a rapid fire, for the purpose of causing the watery parts to evaporate rapidly, without exposing the cocoa to the risk of burning to the vessel; during this part of the process the extract is to be kept in continual agitation, which will prevent it from coagulating, and when the heat has evaporated the liquor to the consistency of treacle, it may be considered to be sufficiently reduced, and after being allowed to cool, may be secured in bottles, and sealed up from the air, and will keep good and ready for use for any length of time.—[*Inrolled in the Inrolment Office, February,* 1830.]

To Richard Green, *of Blackwall, in the county of Middlesex, Ship-builder, for his having invented certain improvements in the construction of main-masts.* —[Sealed 5th February, 1829.]

This invention applies to the construction of that description of masts for ships, which are composed of several pieces of timber combined together, called *made masts,* in distinction from solid masts, and the peculiar method of putting these pieces together, constitutes the subject of the patent which is described as follows :—

Plate XII. Fig. 3, represents my invention as applied to joining the butts of two pieces, *a, b,* of square baulk timber, such as is used in forming the larger sized made-masts; *e,* is a square tennon, formed on the piece *b,* of the length of six or eight inches and four inches square, and fitting into a corresponding mortice cut in the end of

the piece *a*; *rr, ss,* is a wrought iron brace let into the piece *a, b,* so as to be flush with their surfaces; there is a corresponding wrought iron brace at the opposite side of the pieces *a, b,* and the two braces are bolted through the timber to each other.

It will be observed, that the brace is wider at the two ends *rr,* than it is in the middle, thus forming a double dovetail; the ends *rr,* are also thicker than the rest of the brace, forming the shoulder on the under side, and consequently let deeper into the wood.

Fig. 4, is a side elevation of the said brace, drawn to a larger scale, in order to shew more clearly the increased thickness of the ends *rr*; fig. 5, is a plan of the said brace; and it will be observed, that the width of the metal is increased at every bolt hole, and at the joining of the butts. Fig. 6, is a transverse section of fig. 3.

The butts of the pieces of square timber are thus secured, first taking care to pay their ends with coal tar, or any such mixture, and introducing a piece of canvas between the two, well soaked in the same composition.

The core or spindle of this mast is to be made of one or four square pieces, according to the diameter of the mast, and the several pieces to be connected round it with dowels or coakes being introduced between all the surfaces four feet apart, three inches in diameter, and go one inch and a half into each piece. A bolt of one inch in diameter is to driven through all the pieces at every other dowel in each surface, thus preventing the dowels from canting and the mast from twisting in the bracing up of the yards. The mast is then rounded and tapered from the heel and head, and hoops are drifted on, taking care that each butt shall be covered with a hoop. Where drift hoop cannot be used, clasp or wedge hoops should be substituted.

It will be understood that no two butts or joints must lie in the same transverse section, they must be so shifted as to have a hoop between each.

Fig. 7, is a transverse section of a mast composed of four three-sided pieces of timber; the section is supposed to be just at the butt of the piece; *d,* represents the square mortice to receive a square tennon before mentioned.

It will be evident that when the pieces of timber of this shape are used to form the mast, the two braces, which must in this case be placed as shewn in fig. 7, cannot be bolted through to each other, and wood or coach screws (as they are termed) therefore, only must be used to hold them in their places, as shewn by the dotted lines.

Fig. 8, is a perspective view of the piece *d,* united after the manner of my invention to the piece *f.* The upper end of the piece *d,* is prepared to receive other similar braces, and *g,* is a square tennon as before alluded to. It will be seen by this figure that the three-sided pieces are connected together by dowels or coakes, three feet apart, three inches in diameter, and go one inch and a half into each piece, and may be bolted together if necessary, and hooped with drift or clasp hoops as in the larger masts, taking care to cover the butts with a hoop as before stated, which butts should be about ten feet apart, thus having three hoops between each.—[*Inrolled in the Inrolment Office, April,* 1829.]

COCHRANE AND GALLOWAY *v.* BRAITHWAITE AND ERICSSON.

An alleged infringement by Messrs. Braithwaite and Ericsson of the Patent right of Messrs. Cochrane and Galloway having been the subject of some recent discussion

in the Court of Chancery, and which invention being, as we hear, about to be brought before the Judges, we have considered a report of the principles of the invention would be acceptable to our readers; the date of the Patent (1818) being antecedent to the commencement of our Journal, and the specification therefore not previously noticed by us. The invention of Messrs. Braithwaite and Ericsson, which constitutes the subject of the alleged infringement, will be found in Vol. IV. of our Second Series, page 188. The following is an extract from the specification of the Patent granted to

To Sir THOMAS COCHRANE, *Knt. and* ALEXANDER GALLOWAY, *Engineer, for the working or making a manufacture, being a machine or machines for removing the inconvenience of smoke or gases generated in stoves, furnaces or fire places, by the ignition or combustion of coals, or other inflammable substances, and in certain cases for directing the heat and applying such smoke or gases to various useful purposes, which will be of great public utility.*—[Sealed 4th May, 1818.]

"OUR said invention consists of making and forming a machine or machines for the heating of boilers, and may be denominated improved air-tight stoves, furnaces, or fire-places, into which coals or other combustible and inflammable substances shall be used to generate and convey heat, by the ignition and combustion of coal or other fit substance; and which air-tight stoves, furnaces, or fire-places must be composed and formed of any suitable materials, and with means which will permit the entrance and prevent the escape of any atmospheric air or gas into or from such stove, furnace, or fire-place, but at the situation or situations formed for the introduction and exit of such air or gas; by means of pumps, valves, or other suitable machinery, which shall be capable of supplying any such stoves, furnaces, or fire-places, with any required quantity of atmospheric air, to keep up the ignition of any fuel or combustible substance; and at the same time to force out of any such stove, furnace, or fire-place, any smoke or gas so generated against any required resistance or pressure.

"Our invention is of a three-fold character—the first part of it is for removing the inconvenience of smoke or gases generated in stoves, furnaces, or fire-places, by the ignition or combustion of coals or other inflammable substances; the second part is in certain cases for directing the heat so generated; and the third part is for applying such smoke or gas to various useful purposes hereafter to be explained.

"These said branches or parts of our invention may be applied collectively, or so much of them as may be required, under a great variety of modifications, which will be familiar to any competent workman constructing such works.

"In Plate XII, figs. 9, and 10, are views of machines for forming air-tight stoves, furnaces, or fire-places, for heating boilers for generating steam, with the apparatus for blowing in compressed air into the fire-place, and for condensing and dissipating, and thereby removing, the inconvenience and annoyance of smoke and gases generated in any air-tight stove, furnace, or fire-place, but without applying such smoke or gas to any useful object, and which are applicable to any land situation, but of such dimensions and modifications as may best suit the particular convenience of the employment and place to which they are to be applied.

"*AAAA*, show an air-tight, horizontal, and vertical stove, furnace or fire-place, with its flues to heat a boiler for generating steam, or for such other purposes to which it may be found convenient to apply the action of heat. *B*, is the pipe through which a supply of atmospheric air is conveyed by means of a pump or pumps, or other instrument for forcing air into the fire-place to keep up the combustion of any fuel previously ignited. In the pipe *B*, is contained a metal valve, which shuts against its seat by the pressure of the smoke from the fire, and opens by the force of the atmospheric air conveyed from the pump or other proper instrument employed to blow in the air.

"The pipe *B*, may either discharge its supplies of air by being introduced under or upon the ignited fuel of the horizontal fire, or be conveyed into any convenient part of the vertical fire-place; or if more than one pump is employed for this purpose, then the air may be blown into both fires at once, as circumstances may point out. *C, is the plate or valve by which the smoke, gas, and heated air are compressed, according to the pressure placed on such plate or valve either by any weight or fluid, or by any other known means of producing any required resistance.* The opening or rising from its seat of the valve or plate C, allows the escape of the smoke, gas, and heated air, when the inflammable parts of the smoke shall have been subjected to any required degree of exhaustion, according to the resistance made to their escape.

"The reservoir or vessel D, receives and encloses the end of the pipe which forms the seat of the valve C, *and is made to contain the required quantity of water that shall be sufficient to perform the double object of confining the smoke until it is deprived by the action of the fire of any required quantity of its combustible pro-*

perties; and in its exit and passage through the water it is cleansed of some of its mucilaginous properties, and in such a purified state it may either be collected for any useful object, or it may be allowed to escape into the atmosphere without creating the inconvenience and annoyance generally experienced from the exit of foul smoke from any ordinary chimney, particularly from those chimneys employed for the use of steam engines. E, is the iron door to shut off the fire, and the ash pit G. F, is the metal chamber which encloses the fire-doors E, and the ash pit G, and which must be made perfectly air-tight when its cover I, is shut into its mouth H.

This mouth, or curved orifice, in the chamber F, furnishes, when it its open, an introduction to the doors of the fire and ash-pit. The spherical cover I, must be fitted and ground correctly air-tight into the mouth of the chamber F, and which is kept in that state by the pressure of the screw J, and by which means the atmospheric air is prevented entering into the fire or the ash pit, through the door E. The smoke, gas, or heated air, are equally secured from escaping through the doors of the fire and ash pit.

K, is the iron bridge which swings on its pivots, and which is connected to the chamber F, and into which the screw J, works by its lever, L, and by a few turns of which screw the cover I, is permitted to move out of the way of the orifice or mouth of the chamber, and thereby gives a free entrance into it when required.

" M, M, are metal tubes of sufficient length to prevent the action of the fire from injuring the strong glass or glasses that is to be fixed in them for viewing the fire, and of such a diameter as will afford a general survey of the fire; these tubes, with their glasses, must be made air-tight, and fixed securely in the spherical cover, I, opposite the apertures made in the fire-doors to view the fire.

"N, is an iron rake, with a shifting handle, and a roller or feet placed at the bottom to prevent the teeth of the rake from falling entirely out of the fire bars, although it is desirable that they should be as low as possible; and it is necessary, when this rake is not in use, that it should be kept in the recess made for it in the ash-pit at *d*, and which is introduced into the ash pit for distributing the fire, and for clearing the bars on which the fire is placed; which rake moves in a ball and socket stuffing box, O, inserted in the cover I. By this means the fire is raked without opening the cover, and without sustaining any loss of the compressed air with which the fire and ash-pit is supplied.

"P, is a metallic magazine placed at the top of the vertical fire, and surrounded with a case or reservoir for holding of water to keep the reservoir from becoming too warm, and from which the boiler may be supplied with warm water as fast as the reservoir is fed with cold water, and which magazine P, may be made to contain any required supply of unignited fuel, and which magazine must be made air-tight in all its parts.

"Q, is the frame or mouth of the magazine through which the fuel is to be conveyed into the interior of it. R, is the air-tight cover or plate, which by the pressure of the screw S, working through the swinging bridge T, forces down the cover R.

"Near the bottom of the magazine P, is placed a valve or door V, with an axle through or across its centre after the manner of a throttle-valve of a steam-engine as respects the axle of the vale or door; one-half of which valve or door will rest, when closed, on the lower part of the seat WW, while the other half of the valve or door rests on the upper part of the seat.

"The form of the valve-seat as shown at WW, will be found to be very convenient, as by its angular shape no coals or other fuel will lay upon it to obstruct the shutting of the valve or door V, which is performed by the motion of a handle.

"The object of this valve or door is not only to shut off the unignited fuel from the vertical fire, but to allow the magazine, P, to be replenished with fuel as often as required without permitting any considerable escape of smoke, gas, or heated air; and when the cover R, is closed or shut, then the valve V, may be opened whenever the fire shall require any additional supply of fuel; and when it is so opened, the cover R, must completely prevent the escape of any smoke, gas, or heated air, through the magazine P.

"Y, is a chimney of any required height, issuing from the top of the boiler, and in connexion with the flue with its cover Z; its screw *e*, the bridge *f*, in which the screw works, and the lever *g*, by which it is moved. This chimney may be used for carrying off the smoke when the fire is first lighted, and when the valve or cover I, is opened to admit freely and copiously the atmospheric air under the fire.

"When the stove, furnace, or fire-place of the boiler is so used then it is a fire on the common principle, and when used in that state it forms no part of our invention; but when the covers and valves I, and Z, with either the cover R, or the valve V, are shut by any sufficient machinery, and rendered air-tight in those parts, and a full supply of atmospheric air forced into the fire at the place or places assigned for its entrance, then such a change and combination in the machinery puts this part of the principle of our invention in full force.

"A fire-place and its apparatus, thus arranged, will produce not only a saving of fuel, by extracting a greater quantity of combustible material from the fuel, but will direct the heat to the object of its application more effectually than hitherto done, and will at the same time, remove the inconvenience and annoyance sustained from the issue of large quantities of foul smoke as at present experienced from ordinary fires and chimneys employed for the heating of boilers.

Figure 10, shews a view of a boiler, flues, &c. similar to the boiler, flues, &c. shown in figure 9, but fitted to a ship or vessel, and from which the smoke, gas, and heated air are permitted to escape for dissipation through the side of such ship or vessel into the water, at such a depth from the surface as may be necessary. The smoke-pipe or horizontal chimney B, leading from the boiler A, contains the valve C, which opens by the pressure of the smoke, and is shut by that of the water. The pipe or chimney B, is surrounded, and the valve C, guarded by the metal case or pipe DD, which connects to the boiler, and is made water-tight and of such dimensions as shall contain a sufficient quantity of water to keep the case or pipe DD, so cool as not to injure the timber of the vessel with which it comes immediately in contact. *The pressure on the valve* C, *is regulated by its area, and the height of the external column of water bearing on the valve, and according to which pressure must be the force of the compressed atmospheric air, necessary to feed the fire in which the smoke is generated.*

Another feature of novelty proposed in the latter part of the specifications is to conduct the heated air or gas from the flue into the box of the paddle wheel, for the purpose of assisting in propelling the vessel, but we consider there are some practised objections to the employments of this contrivance, and as it does not bear upon the parts said to be infringed, we have omitted it.

The abstract parts, or the combinations of machinery, by which we construct our air-tight stoves, furnaces, or fire places, we do not claim, but as they are necessary as means, to effect the object of our invention: these objects may also be effected and produced by other abstract parts and combinations of machinery, not explained or described either in this specification, or in the drawings annexed; but yet such alterations may be made embracing the principles of our invention that may be a different modification of them, and yet be substantially in their effects and principles our invention; which is for the working or making a manufacture, being a machine or machines for removing the inconvenience of smoke or gases generated in stoves, furnaces, or fire-places, by the ignition or combustion of coals or other inflammable substances; and in certain cases for directing the heat, and applying such smoke or gases to various useful purposes.—*Inrolled, Nov.* 1818.

To JOHN YATES *of Hyde, in the county of Chester, calico-printer, for his invention of a method or process of giving a metallic surface to cotton, silk, linen, and other fabrics.*—[Sealed 26th January, 1830.]

THIS invention is a method or process by which a very beautiful metallic surface can be given to cotton, silk, linen, or other fabrics, to be used in printed furniture, hangings for the walls of rooms, and various other purposes. The effect produced by the different coloured printed figures on the metallic surface is very beautiful The following description will explain this method of effecting the same :—

SPECIFICATION.

" My said invention consists in applying a metallic surface to cotton, linen, silk, and other fabrics, by reducing the metal or metals employed to a state of powder, afterwards mixing that powder with some farinaceous paste or other mucilaginous or cohesive substance, such as glue or gum, to cause it to adhere to the cloth or fabric to which it is to be applied, and by subjecting the cloth to which the powder has been applied to a high degree of friction, in order to produce the bright or burnished appearance of metal at much less expense than has been hitherto effected. And in further compliance with the said proviso, I, the said John Yates, do hereby declare, that the manner in which my said invention is to be performed is set forth in the following description, that is to say, the metal I commonly use is tin, as combining cheapness with brilliancy, and I dissolve it by means of a sand bath, in pure muriatic acid, of the specific gravity of 1.160, or thereabouts, until the quantity of acid used is saturated with the tin, which is always known when any portion of the latter continues in the vessel undissolved by the acid. This solution so prepared and ready for use, I keep carefully made up in bottles to prevent its absorbing oxygen ; I then employ a vessel of wood, about five feet long, three feet wide, and one foot deep, along which I place lengthwise an iron centre, which runs on its own axis, and having supporters on which centre I frame a cylinder of hoops of zinc or spelter, running the whole length of the vessel, each hoop being fourteen to twenty inches in diameter, about five or six inches wide, and one or two thick; the cylinder is so placed as to run about half an inch deep in the liquor used, I then fill the vessel with pure cold water, and the solution of tin before mentioned, in the proportion of one part of the solution to ten parts of water, and the cylinder is made to revolve slowly by the application of any moving power, so as continually to present a fresh surface to the liquor in the vessel. This process is continued, the tin appearing reformed or revived on the whole surface of the cylinder, by the combination of the zinc of the cylinder with the oxygen of the tin previously dissolved in the liquor, and consequent precipitation or revival of the tin, according to a principle well known and acted upon in chemical manufactories. The tin so reformed or revived is carefully scraped off by a wooden or metallic instrument into another vessel in which it is washed with clear water, in order to deprive it of every impurity, the water being changed or renewed until it becomes tasteless.

" The metal after being subjected to this washing is taken out and ground between two flat pieces of wood until it will pass through a fine brass wire sieve; it is then boiled several hours in water, and is afterwards put upon flakes or filters of cloth in a stove to dry; when dry it is again passed through a fine brass sieve, and again boiled in water for about four hours; after it has undergone the second boiling I add to the water in which the metal continued after the second boiling a little diluted muriatic acid in order to take away any oxidation of the metal, which might have occurred during the operations above described, or any remaining impurity. It is then again washed in cold water, until the water becomes tasteless, and being then taken out, dried as before, and again passed through a fine brass wire sieve, it is fit for use in the next stage of my process.

"In order to apply the powder to cover the whole surface on one side of any fabric of cloth composed of cotton, linen, or silk, either separately or combined, I proceed as follows; my cloth being scoured, cleaned, bleached, or dyed as may be required, I pass it through a friction or common calender to give the fabric a firm, and smooth face. I then by means of a machine or block or brush, any of which may be used for this purpose, lay on a uniform covering of starch or paste of sufficient consistency to work easily; the starch which I use for the purpose, being made by dissolving about one pound and a half of starch in one gallon of water; a covering or coat of the dry metallic powder is then carefully laid on the surface with a soft brush, and the cloth is afterwards dried. In some cases, I prefer drying the piece after the starch or paste has been laid on, and afterwards wetting it again with cold water, by a brush on the face, or I immerse the piece upon which the starch or paste has been laid and dried in water, and after the immersion I pass it through padding rollers, so as to leave it uniformly wet. I then apply the metallic powder in the manner before mentioned: when perfectly dry the piece must be well brushed with a hard brush, to take off all the powder which does not firmly adhere. I then pass the cloth through a friction calender of the ordinary description employed in glazing calicoes, or I pass it over second hand cards as hereinafter described, or I glaze it by hand.

"The pieces when thus finished may have figures embossed upon them, or may be printed with colours, or varnish may be employed to give various hues to the metallic face, or a watered effect may be given to the fabric. To produce the latter effect, I pass it again through the calender, which for that purpose must have a fine cotton or linen cloth wrapped round one of the cylinders before the operation. In order to cover part only of any piece of cloth or other fabric with a metallic surface, I pass the piece through a common or friction calender, in order to make the face firm and smooth to the touch, I then apply starch or paste, by means of a machine, or block, or brush over those parts of the fabric on which the figure is required. I then carefully apply the metallic powder with a soft brush, whilst the impression is wet as before described until the piece is finished. The cloth is afterwards dried and brushed well with a hard brush, in order to remove all the superfluous powder that may attach to the piece. After this operation the piece must be passed through a slightly heated friction calender, or may be glazed by hand so as to cause the raising or burnishing of the metallic surface required.

" In order to produce the effect of matted or dead silver, I make use of old steel cards (which have been previously used for carding cotton) which I so fix upon a board, or in a frame, or in a roller, as that the piece of cloth or other fabric may be drawn against them the smooth way of the card until the metallic surface assumes a dead or matted appearance.

" In order to apply my invention to yarns or thread in the skein or hank, or in the warp, the same process must be gone through as is hereinbefore described with respect to piece goods, taking care to use starch thinner in point of consistency The starch which I use for this purpose is made by disolving about one pound of starch to one gallon of water; care must also be taken that the threads be kept sufficiently separate and distinct, so as to admit of the metallic powder reaching and covering every part of the thread. The dressing machine commonly used by power loom weavers answers very well for that purpose.

"In applying my invention to paper, I use the same process as is done in piece goods, except that when I again wet the starch or paste which has been suffered to dry on the paper, I do it in all cases by applying water by means of a brush as before described, and not by immersion in water. The starch used being of the consistency produced by dissolving about one pound and a half of starch in one gallon of water. In applying my invention to leather the process is the same as is hereinbefore described with respect to piece goods, except that I commonly use glue as the adhesive substance for fixing the powder firmly upon the leather, dissolving about four pounds of glue in one gallon of water, and the glue being used when quite hot, the powder being applied either immediately after the glue is put on or after the glue has dried, and being again wetted in the manner before mentioned, in describing the process of applying the powder by means of starch to fabrics of cotton, linen, or silk. The friction necessary to give the bright or burnished appearance may be applied by hand according to the nature of work required to be done. To produce the appearance of matted or dead silver, second hand cards may be employed as before described. Leather, which has been curried and polished as for sale, is the best for the purposes aforesaid.

"Although I have in the previous description stated the size of the vessel and the description and strength of acid I use, and also that I prefer starch as the adhesive substance for attaching the powder to cotton, linen, or silk, either separately or mixed, or in yarns, or in the piece, or to paper. I declare that the vessels in which the metals are revived or reformed may be adapted in point of size to the extent of the production required, and as tin is soluble by all or most of the mineral, and some of the vegetable acid, that any of such acids may be used for dissolving the metal, although I prefer and use the muriatic acid, and I further declare that the strength of the acids and solutions employed may be varied, modified, and reduced according to the quantity of precipitate or revived metal required. And I also use starch in preference to other mucilaginous or cohesive substance, as being more easily reduced to the consistency required by the nature of the work to be performed. And I declare that I do not claim as my invention either the solution of the tin or metal employed by means of muriatic or other acid, or the reviving or re forming of the tin or other metal, that process being well known, or any part of my process taken separately, as the various operations, are of constant occurrence, in different manufactories; but I do claim as of my sole invention, the combination and employment of the several operations, of reforming the tin or other metals, in a state of fine powder, the application of the metal, in that state to the fabric used, and the use of a high degree of friction to raise a metallic surface or figure, at a much less expense than has hitherto been effected, such a result having been heretofore produced by methods in which these combinations have not occurred, and I claim such process whether the whole be effected by hand or manual labour, or by the use and adaption of any machinery to the purpose; And I further declare that although I have in the foregoing description exhibited my invention of giving a metallic surface to cotton, silk, linen, and other fabrics, by the employment of tin only yet the same process may be used with corresponding results, whether that metal or silver, lead, bismuth or antimony, either separately or in combination, is or are the metal or metals employed. And I therefore claim as my invention, the process or method of giving a metallic surface to cotton silk, linen, and other fabrics by the application of a metallic powder in manner hereinbefore expressed whether the metal employed be tin, silver, lead, bismuth or antimony separately or in combination, and where the metal or metals employed is or are first reduced to a powder, and where after its application friction shall be used in raising the metallic surface.—[*Inrolled in the Roll's Chapel Office, July,* 1830.]

Specification drawn by Mr. Newton.

AMERICAN PATENT.

Specification of a patent for a machine for Grinding Flax Seed, and other kinds of grain, paints, medicines, and other substances. Granted to ASAHEL CROSS, *and* EZRA BROWN, *Cazenovia, Madison County, New York, February 4th,* 1830.

ON a horizontal shaft two feet six inches, or three feet in length, and ten inches from one end of the same, is placed a cast-iron wheel, eighteen inches in diameter, and one inch, or more, in thickness; the flat sides of which are turned straight and smooth. Two cast iron wheels or cylinders, nine inches in diameter and four inches in thickness, the circular surfaces of which are turned straight and smooth, are placed on two shafts, two feet in length and near one end of the same. These shafts are placed in a horizontal position across, and at right angles with, the first mentioned shaft, and from three to four inches below the same (measuring from centre to centre) one on each side of the flat wheel, and in such a manner as to bring the smooth surfaces of the cylinders in contact with the smooth sides of the flat wheel; the outer ends of the cylinders extending as far as the outer extremity of the flat wheel at the point where they come in contact. The pivots on the ends of all the shafts run in boxes of metal, or other substance, attached to a frame prepared for the purpose.

The perpendicular flat wheel constitutes the principle of the improvement in the above machine, by operating between two cylinders or rollers, similar to those heretofore in use.

Operation.

This machine is propelled by water, hand, or other power, by attaching a pulley and strap, or other gear, to each shaft. The seed, &c. is fed from above into the machine, on each side of the flat wheel, between that and the cylinders. The flat wheel and cylinders are put in motion in a direction calculated to draw the feed between them; the flat wheel and cylinders making an equal number of revolutions in the same time. For some uses, this machine may be made much smaller than above described; but the flat wheel and cylinders should be nearly in the same proportion to each other.

The principle of this machine in its operation, in its improved form, is, it breaks the seed or substance, and at the same time, by the raking motion of the flat wheel against the cylinders, in consequence of their being placed below its centre, it effectually grinds or pulverizes it.

REPORT

Of the Select Commitee of the House of Commons on the Laws of Patents.

(Continued from page 297.)

Mr. John Farey, again called in; and examined.

WHAT papers have you brought with you?—A list of our Acts of Parliament, and decisions of courts of law, relative to royal grants by letters patent; a list of the number of English patents granted in each year since 1796, with an enumeration of a few of the most important ones; an edition of the foreign laws of patents, in the French language, and manuscript translations which I have made therefrom into English; viz. of the Americon, the French, the Belgian, the Austrian, and the Spanish laws. These are all the patent laws I have ever heard of except the Prussian, and the Russian law, of which last I learned something when I was in that country a few years ago, but I have not got them in writing; I think I could procure a copy before next Session. I hope I shall get official copies in the original languages to compare my translations with them; I have already obtained some such copies, and am promised others; if the Committee wish my translations to be printed, I will proceed to verify those I can.

What are you prepared to deliver in for printing?—The American law re-translated into English from an official French translation; the French law translated into English from the French official edition; the Belgian law translated into English from a French edition, not official; the Austrian laws and the Spanish laws translated into English from a French edition, not official.—Since I made the translations I have obtained an authentic American impression of their law, and also an official copy of the Belgian law in Dutch and French; I will verify the present manuscript of my translations by those, and such other official copies of the laws of each country as I can get before the printing. Of the Austrian and Spanish laws I have not received official copies yet; but I have no reason to doubt the correctness of the French edition from which I translated.

[The Witness delivered in the same.]

(Mr. Farey.) If I may make any remark upon these laws, it is, that they are very superior to our system, and will all be useful to study as models: not to be adopted exactly for this country; but a selection of some articles (with such modifications as our different state of commerce and manufactures require,) would serve as guides for us.

The great distinction in our state, compared with that of all other countries that I have visited is, the powerful means of execution that we possess; for money, materials, tools, buildings and workmen are all ready at very short notice to put a new scheme in practice. Also the very active spirit of competition and rivalry with which those extensive means are exercised; the excessive rapidity and extensive spread of new ideas, by our periodical publications; the facility of personal intercourse by travelling in public coaches, and by steam; the very expressive nature of the technical language that is in use amongst all our artizans; also the established habit that the English have, more than any other people, of associating themselves into bodies and societies to act in concert to effect a common object.

All these circumstances are the great means of our national productiveness; but under our present system of patent laws those means are unavailable, and are even rendered inimical to the interests of the inventors of new improvements; because those inventors are bound by law to work in secret, and with their own hands, until they get their patents; and they must rest all their future claims upon the merit of what they can produce within a very short time after bringing out their ideas from secrecy, and before the knowledge of the invention can be so spread, as to bring those national advantages to bear upon it, in order to give the invention practibility of execution, and that perfection which can only result from practice.

By the time that the inventor has been thus obliged to fix himself definitively, by a specification (in which no amendment can be made), all the powerful means of execution that I have alluded to, come into activity to cultivate the new invention if it is a good one; and if in the end it happens that what was done privately by the inventor at first, under every disadvantage, is superseded by what can be done openly afterwards, by the united exertions of himself and others in a long course, under every advantage, he is condemned to lose his right, as having failed in law, if not in fact, because whatever he may afterwards do, he must be judged by his specification, without regard to his subsequent practice.

In foreign countries the means of execution are so limited and communication so slow, that the above circumstances are very different; there, almost every thing depends upon the individual and continued exertions of the inventor, who can derive but little aid from others, but in return he is not so liable to be superseded afterwards; he can often attain nearly as much perfection in private as openly; but that perfection is small, compared with what we can do here in public.

The object of our patent law should be, to encourage the inventor to devote all his means to the cultivation of his new ideas, and to bring all those national means to bear upon them, in order to advance them to that point of perfection, when the public can take them up, and carry them on with some advantage; and the law should be adapted then to encourage a free public exercise, with the reservation only, of such a tax upon that exercise, as will be enough to reward the inventor, and repay the costs of attaining the first degree of perfection. The terms of a law to fulfil such conditions, must be relative to the existing state of the public means I have alluded to. It may be farther observed that our advanced state, and facilities of practising new arts, does not dispense with the necessity of obtaining a constant accession of new inventions to exercise our activity upon. On the contrary we now require new improvements on our present state, as much as we did formerly to bring us to that state. To enable us to get good inventions, all that are offered must be allowed a fair and sufficient trial, and we must select the good from the bad, by trial alone, for the best judges of these matters cannot determine *à priori* which will turn out good, and which will fail.

Have you any thing else to produce?—I have some notes which I have put down in writing, of opinions I have had occasion to form at various times, on detached points of patent law, but which were not called for by the questions put to me when I was examined before.

Did you write to Mr. Dyer to request him to attend this Committee?—I did, but he is in ill health, and cannot leave home.

Will you allow your letter to be produced?—I wrote him to that effect on the 13th May; and, with permission, will read an extract from my letter, with another from his reply, which supports what I have just remarked.

"It appears to me that there is a fundamental error in the "feeling with which courts of justice take up the subject of "patent rights; they assume that the patent is given solely as "a reward for the disclosure of a secret invention that has "been concocted by the inventor in private, before he applied "for his patent, and that the right granted by the patent is "also conditional on the event, that the secret when disclosed "in the specification, shall prove in every respect what the "inventor professed it to be, namely, that it was wholly within "his own power to have disclosed or concealed it at the date "of the patent, and when disclosed in the specification, that it "shall, in that state, be new, ingenious and publicly useful.— "Upon these premises if the invention becomes known before "the date of the patent, without the inventor's act, or if, when disclosed by the specification, it is not what it ought to be, the conditional patent becomes void, and cannot be made good by any subsequent acts whatever. The propriety of making a deficient invention good after it is disclosed is not contemplated or provided for, and yet in fact it almost always happens, that the inventions which ultimately come to be of great public value, were scarcely worth any thing, in the crude state in which they emerged from secrecy; but by the subsequent application of skill, capital, and by well directed exertions of the labour of a number of inferior artisans and practicians, the crude inventions are with great time, exertion and expense, brought to bear to the benefit of the community. The first inventor is not always a person the best qualified to go through all this process of training and establishing his own secret production in real use; but whenever that is the case, the incompetent inventor would find it to his interest to sell his crude ideas to others more qualified to put them into successful practice, if such transfer were provided for, and encouraged by law.

" My view of the true policy of a patent law is very different: I consider that patents ought not merely to be viewed in the light of rewards for what has been done in secret before the patent is granted, but more particularly as holding out an inducement and encouragement for doing what requires to be done publicly afterwards; and insuring a competent reward for successful exertions in bringing the invention into use. I would consider the granting of a patent to be like letting out a branch of uncultivated industry on lease for a term of years, to some person who is qualified in talent, capital and activity, to work that new branch, and bring it to a system fit for common and general use amongst inferior people, who would not of themselves have had the necessary means of establishing a new and imperfect art, although they have every facility for adopting and practising an art previously brought to tolerable perfection. In chusing such a lessee of the new branch of industry, we must of necessity give the preference to him who first becomes a candidate for the lease, because it is his of right; but if the prospect of successful cultivation is so open and good, that several competitors would be willing to take the lease, we should encourage a transfer of the right of priority to that one who is best qualified to work the lease advantageously. There is every probability that he who can obtain from the first candidate a cession or assignment of the right of precedency, will be better qualified to work the lease than that first candidate himself, because that cession or assignment is in itself

" a full acknowledgment of the superior means of the assignee. " Our present patent law takes quite a different view, and looks " with a very jealous eye upon the assignees of inventors; and " in Parliament they are not allowed to have the right that is " acknowledged to belong to inventors themselves: this is particularly observable in the House of Lords, who have a " Standing Order (which is in effect a law) that no assignee " of an inventor shall be allowed to bring in a Bill for an extension of the term of a patent. Hence, if an assignee has " worked ever so much upon an invention that he has purchased, and brought into use for public benefit, he cannot be " allowed to state his case.

To this letter I received an answer from Mr. Dyer, dated the 29th of May, in which he says, " My own ideas accord " entirely with those expressed by you upon the subject of the " proper policy of patent law, and especially with reference to " the general worthlessness of first ideas of inventions (which " is all that can now be secured by patent) unless those first " ideas are followed up by extended experiments, and improvements upon the first suggestions. As the law stands now, " every patentee must endeavour to avoid any alterations and " improvements on his invention, however valuable in practice, " lest such alterations should vitiate his right under the patent; and as to taking out a new patent for improvements, " besides the objection on account of the heavy expense of such " new patent, it would seldom hold good, because such improvements are made progressively, and are brought into use one " after another, almost imperceptibly, in consequence of the " experiments and alterations made in the course of extensive " practice; hence such improvements must unavoidably become " known to the people employed thereon, long before a patent " can be obtained for them, and that previous knowledge, it " seems, would be held fatal to the new patent. Also, the existence of a first patent is often deemed sufficient to avoid a " new patent for improvements, although by the same inventor, " because the first, being for a crude invention, not useful " in practice, when executed as described in the specification, " that patent fails; and then the second patent fails on account " of the invention being published by the first. I am sorry " that my want of health absolutely forbids my going up to " attend the Committee."

Have the goodness to state who Mr. Dyer is?—Mr. Dyer is an American, and the origin of his settling in this country is worthy of notice. A self-acting machine was invented here thirty years ago, for making wire cards for preparing wool and cotton; it bended and cut the wires, pricked holes in the leather, and inserted the bended teeth into those holes, by one operation, without manual labour; a patent was taken for the invention here, by Messrs. Sharp and Whittemore, in 1799.—The machine was very ingenious, and was made to operate with rapidity; but the cards produced by it were too coarse and imperfect to be used with advantage in this country, where the art of card-making by hand had previously been brought to great perfection; the inventor therefore carried his machine to America, where coarse cards were more in requisition; and as our laws prohibited the exportation of any of our cards, the want of efficient card makers in America rendered a self-acting machine of value there, although not very perfect in its operation; he succeeded in America so far as to carry on a trade, and by practice improved his machinery, till it supplied the American demand very well. Mr. Dyer, who was at that time a merchant, became acquainted with the invention, and thinking it had attained a state of perfection sufficient to be re-exported to England with advantage, he purchased the invention, and came over here to take out a patent, when the original patent was nearly expired. I prepared the specification for Mr. Dyer's patent, in conjunction with Mr. Nicholson, in 1812, and gave him all the assistance in my power towards establishing a manufactory, which he at first intended to begin in London, but ultimately began one in Manchester. When the cards manufactured by this machinery began to be sent out to the cotton and woollen mills, they were found still too coarse and imperfect for efficient use in England; and Mr. Dyer, though not originally a mechanician, set himself to study the subject, until he was able to improve the machinery, and make saleable cards by it. His first set of machines were all destroyed by fire, at an early period of his settling at Manchester, and he lost much property; but in the end that circumstance insured his success, because he made entire new machines, with many improvements that he had found out before the fire, but which could not have been applied with so much perfection by altering the original machines as in making new ones. He was obliged to take another patent for these improvements, and has had other patents since, and has established a considerable trade with advantage.

Do you believe that many useful inventions are lost to the public, from the want of security to inventors, by the present patent laws?—There are many secret inventions of value, which it is not the interest of the inventors to disclose under the present system; but they are practised in secret, to a very limited extent by one individual, so that the public derive only a very small benefit from them; and yet the secret possessors may be getting more than they could get under the present system of patent law, by practising the same invention generally and openly, and with extensive benefit to the public. This circumstance deserves the attention of the Committee. Many men of great talent are so conscious of their superiority, and have it so generally acknowledged, that they become indifferent to the small accession of reputation that they could derive from adding more inventions to their list; hence they cease to be communicative in cases where it is their interest to keep secrets; and endeavour to realize the whole profit of a very small extent of business, for so long as they can preserve their secret, rather than look to a small share in the profit made by the public on a very extensive open practice, for fourteen years under a patent. For instance, Doctor Wollaston had a mode of preparing malleable platina, which he practised in secret for a long time, and only disclosed it on his death bed, and probably very imperfectly. Mr. Watt invented and made a machine for executing sculptures, which he never disclosed; he shewed me many specimens of the performance in ivory and alabaster, in 1814, and made me a present of one carved by his machine, which proved that it must have arrived at considerable perfection; he died in 1819, and I believe never disclosed that invention any further than as the machine may have explained itself.

I did business formerly for a very ingenious mechanic at Sheffield, named Gilpin, who destroyed himself some years ago; he had a machine for cutting the teeth of cog wheels, and another for making hard steel spindles for cotton spinning. The works he produced by them were most excellent; but he kept the means secret, and I do not think they have been practised with any effect since his death. All those inventions ran great risk of being quite forgotten, and their perfection has really been lost, by the death of the inventors before making complete disclosures; also the practice of them was always very much limited by the secrecy observed. I am not certain that a patent law, without any of the objections that I make to the present ones, would have induced the disclosure of such inventions, and certainly would not of others, which are of such a description that it is easy to practise them, and yet preserve secrecy effectually; they are mostly chemical subjects. Mr. Faraday, of the Royal Institution, could I think, give the Committee information on such subjects, which are not in the course of my studies, and I only know them incidentally. There is a process of refining the raw sulphur or brimstone that comes from abroad, which I am told is now practised in secret at a large manufactory in London, with such success and superiority over the ordinary methods, that they have brought nearly all that trade into their own hands. There is a secret black dye for silk practised in London, by Sir Francis Desanges, which was, I believe, in the possession of his father before him, and has been preserved secret for a great length of time, although it has been practised to a large extent; so that they have realised great wealth by it.

There are numbers of medical secrets which are very much boasted of, but as they are out of my line, I can form no opinion if they are really of value. I know of one medical secret, which is of great importance; and as its value has happened accidentally to come fully to my knowledge, I can speak very positively upon it. It is a peculiar medicine and a mode of treatment, by which the king's evil or scrophula, is effectually and certainly cured, so as never to break out again. My only child was so afflicted with scrophula, as to be in danger of becoming blind, and crippled in his limbs; I had the best advice, and followed it strictly, until I found that his case was quite out of the reach of any medical assistance in England; and then I took him to France, to try the skill of that school, but it proved no better, and I was quite in despair. Hearing of this secret treatment, which is practised by a Mrs. Anne Knight, at Dover House, near Arundel, in Sussex, I made very full inquiries into its efficacy, and found that she possesses a certain specific for all scrophulous cases which are not of too long standing. As I felt very averse to submitting my child to any secret treatment, I took great pains previously to satisfy myself of the results of former cases. One was a woman, who had been cured thirty-six years ago by Mrs. Knight's husband, and has never had any return or illness; she has since married, and had two children, now grown up, and quite healthy; one of them has a large family, all very healthy children. Another woman was cured permanently by Mrs. Knight about twenty-eight years ago, and has since married, and had eleven children, of whom nine are living and grown up; they are all most healthy persons. A young man, now twenty-three years of age, was perfectly cured when a child of between three and four years old, and has ever since been quite strong. A young lady, about twenty-five, daughter of a very respectable man in London, was cured thirteen years ago, and has enjoyed very good health ever since. A young man was cured about the same time as the last, and is now twenty-five, a very fine healthy person.—I visited the above individuals, and each one told me of several other cases of persons who had been patients of Mrs. Knight's at the same time with themselves, and were all to their knowledge cured permanently; and none could tell me of any instance of failure or relapse. Cases of cures of less standing, but equally certain and effectual, were very numerous. The marks and scars that I saw on these persons, showed that they had been severely afflicted; they all stated that they have now very strong health.

My child has been under Mrs. Knight's treatment more than a year, and is now nearly cured, and a number of other patients have, to my knowledge, been cured by Mrs. Knight, during the time I have attended her with my child. This valuable secret is in the sole possession of Mrs. Knight, who is arrived at an age when she is very likely to die without making any disclosure; and without the communication of that skill and discrimination which she possesses (and which I believe to be necessary for the successful practice), the mere disclosure of the secret of the medicines she uses, would be only a part of the advantage that would arise from complete instructions being given to all medical practitioners, none of whom can now cure scrophula at all. The secret has been in her family a great number of years; but she has given it perfection, by finding out how to apply the peculiar medicines more successfully than her predecessors. Mrs. Knight has not communicated it to her children, because they have not had a medical education, and they would not be allowed to practise by the College of Surgeons. She was herself in practice long before their Act of Parliament was passed, or else she would not be allowed by law, to do what no physician knows how to do. I would recommend most strongly to Parliament to direct an inquiry respecting this secret, that when its value is proved, as I know it can be, a purchase may be made, and all medical men instructed in it, for the public benefit.

It would be a very good measure to reserve a portion of the revenue derived from the granting of patents, to accumulate and form a fund for the purchase of valuable secret inventions, like Mrs. Knight's, which are not likely to be disclosed by the inducement of any patent law, however complete; and also to reward individuals like Mr. Woolf, whose inventions have not come into use during the terms of their patents, but have afterwards become of national importance.

Would you not, in the latter case, rather recommend an extension of the term of the patent?—Not in all cases. If the inventor has brought his invention to such perfection, that others, by merely copying what he has done, can practise it as well as himself, it would be best to throw it open. Mr. Woolf's was such a case; the engines made on his system by others, since the expiration of his patent, have performed as well as those made in the same interval by himself, and have even obtained a preference in some places; hence the public would probably have gained nothing by confining it longer in his hands; but now that he is seen to be left quite unrewarded for his long exertions, the circumstance, added to others of a similar nature, is very discouraging to men capable of making similar improvements; and I am of opinion that the public would gain, by giving him a handsome reward. In other cases, where there are not many persons capable of taking up the new subject, its progress will be greatly promoted by continuing the patent, because that compels the patentee to continue his exertions to extend the practice. That was Mr. Watt's case. If he had abandoned his engine to the public at the time his first patent would have expired, there was then no other person competent to go on with it, and give it that additional perfection which he attained during the prolongation of the term. No law could be made to distinguish between those cases in which patents should be prolonged, and when rewards should be given instead; but the same discretion that could determine the propriety of an extension, could also decide between that mode and a reward.

With respect to the invention of Dr. Wollaston, he made it profitable to himself?—He did, and it is supposed to a very considerable amount; for every one was surprized to find that he left so much money at his death.

He could not have used it exclusively during so many years as he did and left it to his family after his death, if he had taken out a patent for it?—Certainly not; and in all such cases where the nature of the invention permits of secrecy being effectually preserved, no inducement of patent right will bring them forth, even if the right is made ever so secure by law; because the patent would be totally evaded by infringements made in secret, and which could never be proved in law.

Independently of the risk of such secrets being lost altogether, it is a great public loss to keep them locked up; for they cannot be extensively practised in secret, and the possessors must lay a very heavy tax on the little business they do execute in secret, with their own hands; also, the processes would be more likely to be improved, if they were made publicly known; and new applications of the inventions would be made, which are not done whilst they are kept secret. Hence I think that public purchases of many inventions should always be contemplated, and a fund should be provided for that purpose. There are many other inventions where a secure patent would be preferable to attempting to preserve secrecy, although a patent, under our present law, is not preferable. It is scarcely possible to practise some secrets to a profitable extent, for any length of time, without losing them in the end; for the precautions that must be taken to ensure the secrecy, must tend to cramp and limit the exercise of the invention so much, that only a small proportion of the profit can be realized, that might be made by an open use of it, under a patent, if it were secured by law and for a long term. The medical secret of Mrs. Knight is an instance of the pernicious tendency of secrecy; for although the secret has been safely kept in that family for the greater part of a century, they have taken every possible precaution, and by that care have so limited their practice, as to have only gained a very common maintenance by it; they have refused to send out medicines, for fear of analysis, but stand by to see them taken; they have employed no assistants to compound the medicines; and hence ten or a dozen patients at a time, are as many as can be treated with success. Mrs. Knight has rarely had so many as she could have managed, because the better class of persons have a great aversion to a secret mode of treatment by a woman, and will not go into the inquiries that I did, as to its merits. Mrs. Knight's family never put the secret into writing, for fear of accident, and hence it has always been subject to be lost by the sudden death of the possessor for the time. Hundreds of valuable lives have been lost by the scrophula, and most excessive misery endured, which might have been avoided, if this specific had been made generally known to all practitioners thirty years ago; and probably it might be applied to other uses in medicine.

A process that requires the co-operation of a number of persons for its performance, and the aid of machinery, would almost always be disclosed, if the patent laws were unexceptionable, because it is scarcely possible to keep it long secret.— Messrs. Darwin, of Sheffield, had a means of making rollers of steel, for silversmiths' flatting mills, perfectly cylindrical, and with a most exquisite polish, when quite hard; they had an exclusive trade for some years; and also for silversmiths' hammers and anvils, of hardened steel, polished; but their secret got out, and others now compete with them in some measure.

A machine was used in secret for many years in London, to split hides and skins into two thicknesses, but it became known in time, and others were constructed; the secrecy that was observed retarded the improvement of it, and it did not perform very well until it became more known, and then it was brought to great perfection.

Mr. Lowry, the engraver, invented a machine for ruling parallel lines, for the shading tints in copper-plate engraving; and also the use of pointed diamonds for drawing on the copper; he used it in secret for years, whereby much of his own time was taken up, in secretly doing a common operation with the machine, which any careful person could have done as well as himself, thereby applying less of his time to those exquisite works of art that none but himself were capable of executing; at length his secret got out, through the workmen they employed to make and repair his apparatus, and other machines came into use; he then set young pupils to rule by his machine, and allowed them to work with diamonds.

Mr. Boulton invented and established a mint for coining money at Soho; he took a patent for it in 1790, but afterwards he found out and applied a method of working the coining presses by a steam engine, by the intervention of air pumps, applied to exhaust air from a receiver, and the effort that the atmospheric air makes to enter into and refill that exhaustion, is caused to operate upon and impel pistons fitted into cylinders, from which the air is drawn away into the exhausted receiver; those pistons are so applied as to give motion to the coining presses. This method has been kept secret to this day in England, although the coining presses worked by it are publicly shewn in the Royal Mint. Mr. Boulton fitted up a mint for the Empress Catharine in Russia, and he sent out another to Denmark, but the foreigners do not conceal the air-exhausting method of working the presses; I was allowed to take drawings of the machinery when I was abroad. It is a very valuable invention, which is capable of many other applications. Mr. Hague has recently taken a patent for working tilt hammers by it; also cranes for unloading goods; and that method also suggested to him the patent machinery that he has made for extracting the molasses from sugar, which I mentioned to the Committee before.

Many years ago Mr. Watt invented and applied a small instrument which he called an Indicator, to his steam engine; it indicates what extent of plenum and vacuum is alternately formed within the cylinder, in order to impel the piston when the engine is at work. It is of very important use in giving engine-makers true knowledge how to make good engines; and it is of very great use to the inventor, just as a hydrometer is to a distiller. He kept it a profound secret for many years, and in 1814, when he published an account of his other inventions, he gave only an imperfect description of a part of this one, without any hint of parts which are essential to the successful use. A complete instrument afterwards fell into my hands in Russia, where it had been made by some of the people sent from this country, with Mr. Watt's steam engines. At my return to England I made one, and also showed several other engineers how to make such for themselves; and since that time every one of those persons has very greatly improved his practice by the light it has enabled him to throw upon an obscure part of the operation of steam in an engine. One person who had made an indicator from a sketch that I drew for him, has since printed a description of it in a public journal.

Did Mr. Watt use his invention of a machine for making sculptures, as a matter of profit?—No; but it was obvious to me that he had attained considerable perfection in small works, and soft materials; it might be supposed that his motive for keeping it secret was that he intended to take a patent when he had perfected it, but I have heard him declare, that he had suffered so much anxiety and trouble by the law suits on his patents for the steam engine, that nothing would induce him ever to take another patent; he never made any profit by the machine for sculpture.

Do you conceive that he had brought it to perfection, or that he was only making experiments?—I know he had obtained a certain degree of perfection, for it carved good work in ivory and alabaster, and he was striving at more to make it carve marble, and hard materials; he shewed me some first trials in stone, but they were not perfect, and he did not live to complete a large machine adequate for executing real sculptures in marble. Mr. Chantry executed Mr. Watt's bust, whilst he was engaged in this invention, and could probably give some information concerning it.

Do any evils arise in factories from the workmen being entrusted with secrets which it is in their power to divulge to the injury of their masters?—Yes, the evils are excessive, in the insubordination that they induce; for such workmen cannot be kept in any control, because emissaries from rival manufacturers are always on the watch to seduce them, and they have at all times the means (even if they are under bond to continue to work for the masters) of communicating the secret to rival manufacturers, and thus spite their masters, as well as get bribes for themselves. They may safely reveal the secret at second hand, and there is no remedy whatever, because the communication from them to an intermediate agent, and then from that agent to the rival manufacturer, admits of no proof.

Are workmen occasionally under bond?—In many factories where new processes are practised, workmen are under bond to work for a master, under fixed conditions, during a certain term; they are considered as grown apprentices. It was more the custom formerly than it is now; because it is not found to answer. I am informed, that if the master reserves the power of annulling the bond, it is not legal; and it is a hazardous measure for a master to engage a large number of men, at an absolute certainty; for when trade falls off, he might be ruined, if he could not discharge his men. To come under the nature of articles of apprenticeship, I believe, the bond must be reciprocal on the man to work, and on the master to teach and employ for the term.

Is the keeping the secret a part of the obligation of the bond?—Yes, in many cases it used to be; but as it has never been well decided whether a condition of that kind can be enforced by law, there is a doubt about it. In France it is a positive law in the code, and is constantly acted upon.

Is it not attempted to retain secrets by making the persons entrusted with them, enter into a bond subject to penalties?—It has been attempted, but I believe it has not succeeded; and I know is not commonly done now. The bonds I have known, are merely that the workman shall continue to work for the master during a certain term, under the specified conditions of hours of labour, and wages: but it is of very little avail, for if the workman does not like his place, he will remain under the bond in the factory, and do all the mischief he can, without subjecting himself to the law. I have known magistrates commit workmen for going away, when under such bonds; but I have no doubt, if application had been made to the Court of King's Bench, it would have been found illegal.

Where a bond has been given not to divulge a secret, have you ever known the penalty recovered?—Not from any workman. In the case of Smith *v.* Dickenson, in 1803, (respecting which, I added a note to my former evidence) damages were given.

Do you believe, according to the present state of the law, such a penalty could be recovered?—It is generally understood among such manufacturers, that penalties could not be recovered from workmen, and hence they do not now insert any in the bond; whilst the workmen thought it would have any effect, it was well to put it in; but now the workmen do not care for it.

Is that system very common?—No; it is only in new trades where there are secrets. I have been engaged in works where some hundreds of workmen were working under bond, with very low wages in the bond; but they were allowed to get good wages by piece-work, if they behaved well, if not, the threat of reducing them to bond wages was all the power it gave; it was in the patent net lace manufacture some years ago; I found the men were never restrained by the bonds, unless it suited them, and then they would have done without; their average wages rose and fell by the piece-work, according to the state of the market, like any other trade. They had been only common labourers, and were glad to get into any manufactory, but competent workmen would not have entered into a bond for low wages.

Are you aware that patents have sometimes been supported at law, by collusion between the parties?—Yes, I have known an instance; and there may have been others. It was a case of infringement, in which the patentee feeling afraid his patent would be set aside, compromised before the trial, and arranged that the trial should go on, but that the infringers should defend themselves so as to secure a verdict to the patentee, and make it appear to the public that the patent was good at law.

The effect of that verdict would be to give the public an idea of the validity of the patent having been tried, when in fact it never had been fairly tried?—Yes, it would; and the conditions of the compromise were, that the infringers should take licences at a very high premium, only part of which was paid; and that all parties should make a common purse, to prosecute and prevent any others using the patent; the patentee granting no more licences. The patent was thus converted into a close monopoly. It would not have been the interest of the patentee to have submitted to this, if he could have enforced his patent in spite of any one. For if he had been sure of maintaining his patent, it would have been more to his interest to have granted as many licences as he could, and thus made the practice of his invention very general; but under the uncertainty, it was better to secure a portion of his patent right by collusion, than to run the risk of losing it altogether by the uncertainty of the law.

Do you think, that in a majority of cases, it is the endeavour of the patentee to word his specification so as to deceive the public, and keep back the real method of practising his invention?—Certainly that is not the fact, in a majority of cases. In my own practice, which is of more than twenty years standing, and has been tolerably extensive, I am certain there has not been one case in a hundred, where the patentee has shown the least disposition to conceal any thing, or control me as to what I should put into the specification. In general, in addision to the most ample communications from themselves, they desire me to go, and send my assistants, to inspect, and make drawings, and trials of their apparatus or machinery, giving orders to their servants for our admission at all times, in their absence, and to answer all our questions; by which means I have sometimes acquired a knowledge of particular properties and results of the invention, sooner than the inventor himself. I have found that a decided majority of patentees desire me to specify in such a style of language, and with such drawings, as they think will do them most honour in their character of inventors.

Patentees would be very stupid to attempt concealment, for such attempts must prove abortive, and would defeat the very object they have in taking a patent, for it would certainly be detected by the first infringer who set about practising the invention, and according to the present law, any concealment would vitiate the patent right; but that I think impolitic and often very unjust, because unintentional omissions or obscurities cannot be distinguished from wilful concealments. The examination of the specification which I recommend to be made, before it is received for inrolment, ought to detect and prevent any attempt to conceal, and would ensure disclosure, if the examiners were competent persons. If they were not, or were careless, and allowed an obscure specification to pass, there would always be a complete remedy by giving the courts of law (or other tribunal appointed to try patent rights) a power to inquire into the sufficiency of the specification, just as they do now; with only this difference, that if they found it defective in description, they should order the patentee to bring an amended specification; but should not set the patent aside for such insufficiency, unless the patentee refused to make a new specification to the satisfaction of more competent examiners newly appointed for that purpose, but still subject to future inquiry into that sufficiency.

I have been told that patentees for new medicines commonly inrol fictitious specifications, and keep back the secret of the compositions; but I do not know the fact. Dr. James is said to have done so with his fever powder; if that is true, such patents can be of no use but to adorn advertisements with the King's arms. If there have been many patentees, who have intended concealment, they have not come to me, and I am certain they can have been only a small proportion of those who have taken patents in the time that I have been in business.

An examination of the specifications that are on record will, I am sure, prove to the satisfaction of any person competent to judge of different stiles of composition, that the bulk of those in which there is obscurity, have been written by illiterate persons, unaccustomed to communicate their ideas. The most suspicious class are those specifications in which the real meaning is buried in a jargon of law phrases, which is better adapted to raise quibbles in a court of law, than to instruct artists in their workshops. It is obvious that such cannot be written by the illiterate inventors themselves; but the attempts to entangle infringers by legal subtleties and intricacies, does not answer, because the patentees find to their cost, that such puzzling specifications will not support the patents in court; they are continually set aside. The Judges usually make inquiries of practical men, and if those men get bewildered in law phrases, that is conclusive against the specification, and it is in vain for ingenious counsel to argue, that the words are explicable in law, the court will go by fact, that it is not written properly for aris ts.

[To be continued.]

New Patents Sealed, 1830.

To John Ericsson, of the New Road, in the county of Middlesex, engineer, for his having invented or found out an improved engine for communicating power for mechanical purposes.—Sealed 24th July, 6 months, for Inrolment.

To Abraham Garnett, of Demerara, Esq. for his having invented certain improvements in manufacturing sugar.—24th July, 6 months.

To Samuel Roberts, of Park Grange, near Sheffield, in the county of York, silver plater, for his having invented certain improvements in plating or coating of copper or brass, or mixtures of the same, with other metals or materials, with two metals or substances upon each other; as also a method of making such kind of articles or utensils with the said metal when so plated, as have hitherto been made either entirely of silver, or of copper or brass, or of a mixture of copper and brass plated or coated with silver solely.—26th July, 2 months.

To Richard Ibotson, of Poyle, in the parish of Stanwell, in the county of Middlesex, paper manufacturer, for his having found out an improvement or improvements in the method or apparatus for separating the knots from paper stuff, or pulp used in the manufacture of paper.—29th July, 4 months.

To John Ruthven, of the city of Edinburgh, engineer and manufacturer, for his having invented or found out an improved machinery for navigating vessels and propelling of carriages.—5th August, 6 months.

To James Down, of Leicester, in the county of Leicester, surgeon, for his having found out or invented certain improvements in making gas for illumination, and in the apparatus for the same.—5th August, 6 months.

To John Street, of Clifton, in the county of Gloucester, Esq. for his having invented or found out a new mode of obtaining a rotatory motion by water, steam or gas, or other vapour, being applicable also to the giving blast to furnaces, forges and other purposes, where a constant blast is required.—5th August, 2 months.

To William Dobree, of Fulham, in the county of Middlesex, gentleman, for his having invented or found out an independant safety boat of novel construction.—5th Aug. 6 months.

To William Lane, of Stockport, in the county of Chester, cotton manufacturer, for his having invented or found out certain improvements in machines, which are commonly known among cotton spinners by the names of roving frames, or otherwise called cove frames, or bobbin and fly frames, or jack frames.—5th August, 4 months.

To Thomas Hancock, of Goswell Mews, Goswell Road, in the county of Middlesex, water proof cloth manufacturer, for his having discovered and invented improvements in the manufacture of certain articles of dress or wearing apparel, fancy ornaments and figures, and in the method of rendering certain manufactures and substances in a degree or entirely impervious to air and water, and of protecting certain manufactures and substances from being injured by air water or moisture.—5th Angust, 2 months.

To William Mallet, of Marlborough Street, in the city of Dublin, in that part of our United Kingdom of Great Britain and Ireland called Ireland, iron manufacturer, for his having invented certain improvements in making or constructing certain descriptions of wheel barrows.—5th August, 6 months.

To Charles Shiels, of Liverpool, merchant, in consequence of a communication made to him by a foreigner residing abroad, for certain improvements in the process of preparing and cleansing rice.—5th August, 6 months.

To John Pearse, of Tavistock, in the county of Devon, ironmonger, for his having invented an improved method of making and constructing wheels, and in the application thereof to carriages.—5th August, 6 months.

To Æneas Coffey, of the Dock Distillery, Dublin, distiller, for his having invented certain improvements in the apparatus or machinery used in the process of brewing and distilling.—5th August, 6 months.

To Marmaduke Robinson, of Great George Street, Westminster, navy agent, in consequence of a communication made to him by a certain person residing abroad, for certain improvements in the process of making and purifying sugars.—5th August, 6 months.

To Robert Clough, of Liverpool, ship broker, for his having invented an improved supporting block, to be used in graving docks and for other purposes.—5th August, 6 months.

To Sir Charles Webb Dance, of Heartsbourne Manor Place, in the parish of Bushy, in the county of Hertford, knight, lieutenant-colonel, for his having invented certain improvements in packing and transporting goods.—5th August, 6 months.

To Samuel Smith, of Princes Street, Leicester Fields, in the parish of St. James, Westminster, in the county of Middlesex, gun maker, for his having found out and invented a new nipple or touch hole to be applied to fire arms, for the purpose of firing the same by percussion, and a new cap or primer for containing the priming, by which such fire arms are to be fired.—9th August, 2 months.

To William Palmer, of Wilson Street, Finsbury Square, in the county of Middlesex, gentleman, for his having invented improvements in making candles.—10th August, 6 months.

To John Lawrance, of Birmingham, in the county of Warwick, silversmith, and William Rudder, of Ege, in the county of Gloucester, gentleman, for their having invented or found out an improvement in saddles and girths, by an apparatus affixed to either of them.—10th Aug. 6 months.

To Thomas Ford, of Cannonbury Square, Islington, in the county of Middlesex, chemist, nephew and successor to the late Robert Ford, for his having invented certain improvements in the medicine for the cure of coughs, colds, asthmas and consumptions, known by the name of "Ford's Balsam of Horehound."—12th Aug. 2 months.

To John Knowles, of Farnham, in the county of Surry, hop planter, for his having found out or invented a certain instrument or machine for drawing up hop poles out of the ground, previous to picking the hops, and which, by drawing the poles perpendicularly, will greatly save them, as well as prevent the hops from being bruised, called a hop pole drawer by lever and fulcrum.—13th August, 2 months.

To Samuel Roscoe Bakewell, of Whiskin Street, in the parish of St. James, Clerkenwell, in the county of Middlesex, brick and stone ware manufacturer, in consequence of a communication from certain foreigners residing abroad, and subsequent improvements made by himself, for an invention of certain improvements in machinery, apparatus or implements, to be used in the manufacture of bricks, tiles and other articles, to be formed or made of clay or other plastic materials, part of which said machinery is also applicable to other useful purposes.—18th August, 6 months.

To Matthew Towgood, of Dartford, in the county of Kent, paper maker, and Leapridge Smith, of Paternoster Row, in the city of London, stationer, for their having invented an improved mode of applying size to paper.—18th August, 6 months.

To Major General Joseph Gubbins, of Southampton, in the county of Hampshire, for his having invented certain improvements in propelling and giving motion to machinery.—18th August, 6 months.

CELESTIAL PHENOMENA, FOR SEPTEMBER, 1830.

D.	H.	M.	S.	
1	0	0	0	☉ before the Clock 8 sec.
2	10	0	0	☽ in conj. with λ in Aquarius
2	10	38	0	Ecliptic opposition or ○ full moon.
2	19	0	0	☾ in conj. with φ in Aquarius
4	0	0	0	♃ Stationary
5	0	0	0	☉ before the Clock 1 m. 20 Sec.
5	10	0	0	☾ in conj. with ν in Pisces
6	13	0	0	☾ in conj. with μ in Ceti
7	8	0	0	☾ in conj. with f in Taurus
8	4	0	0	☾ in conj. with γ in Taurus
8	6	0	0	☾ in conj. with 2 δ in Taurus
8	11	0	0	☾ in conj. with α in Taurus
9	1	58	0	☾ in ▭ last quarter
10	0	0	0	☉ before the Clock 3 *m.* 1 Sec.
12	18	0	0	♀ in conj. with ♄. Long. 25° in Cancer. ♀ lat. 5° 6' N. ♄ lat. 1° 9' N. diff. of lat. 13'.
14	9	0	0	♀ in conj. with α in Leo
15	0	0	0	☉ before the Clock 4 *m.* 54 Sec.
15	1	0	0	☾ in conj. with ρ in Leo
16	14	28	0	Eclip. conj. or ● new moon
17	7	0	0	☽ in conj. with η in Virgo
17	19	0	0	☽ in conj. with 1 γ in Virgo
18	12	0	0	☿ in conj. with α in Virgo
18	22	0	0	☿ in conj. with ι in Virgo
19	15	0	0	♀ in conj. with δ in Leo
20	0	0	0	☉ before the Clock 6 *m.* 30 Sec.
21	13	0	0	☽ in conj. with γ in Libra
22	1	0	0	☽ in conj. with ψ in Libra
22	17	0	0	☽ in conj. with φ in Oph
23	1	51	0	☉ enters Libra
24	18	52	0	☽ in □ first quarter
25	0	0	0	☉ before the Clock 8 *m.* 14 Sec.
25	22	0	0	☽ in *d* in Sagitt
29	1	0	0	♄ in conj. with α in Leo
29	21	0	0	☽ in conj. with λ in Aquarius
30	0	0	0	☉ before the Clock 9 *m.* 54 Sec.
30	0	0	0	☿ Stationary
30	0	0	0	♀ in conj. with σ in Leo
30	6	0	0	☽ in conj. with φ in Aquarius

The waxing moon ☽.—the waning moon ☾

Rotherhithe. J. LEWTHWAITE.

METEOROLOGICAL JOURNAL, FOR JULY AND AUGUST, 1830.

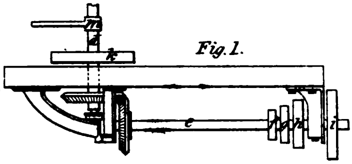
1830.	Them.		Barometer.		Rain in inches.
	Hig.	Low	High.	Low.	
JULY					
26	83	60	30,19	stat.	
27	84	60	30,26	30,24	
28	83	52	30,29	30,21	
29	82	58	30,14	30,03	
30	83	58	29,96	29,86	
31	79	58	30,02	stat.	
AUG.					
1	75	50	29,96	29,84	
2	71	50	29,76	stat.	
3	72	50	29,96	29,91	
4	73	48	30,01	29,91	
5	75	59	29,86	29,83	
6	72	46	29,95	stat.	
7	69	50	29,91	29,78	
8	72	51	29,73	29,71	
9	71	45	29,76	29,74	
10	65	52	29,64	29,62	
11	74	54	29,69	stat.	
12	70	53	29,78	29,70	,025
13	59	53	29,74	29,60	1,025
14	61	47	29,83	29,53	,75
15	63	47	29,81	29,69	
16	65	41	29,86	stat.	,025
17	64	38	29,94	29,90	
18	62	41	30,14	30,05	,1
19	62	39	30,11	30,03	
20	61	42	29,92	stat.	
21	68	45	29,96	29,93	
22	68	83	29,96	stat.	
23	67	53	29,96	29,84	,025
24	70	52	29,84	stat.	
25	66	53	29,76	29,72	,05

EDMONTON. CHARLES H. ADAMS.

NOV 7 1917

Hewe's Impd. Wind Mills.

Fig. 1.



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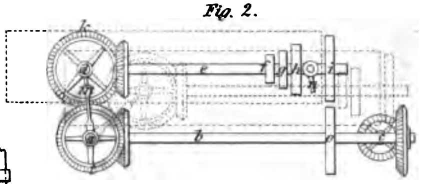

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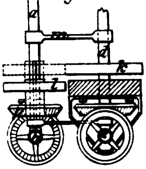

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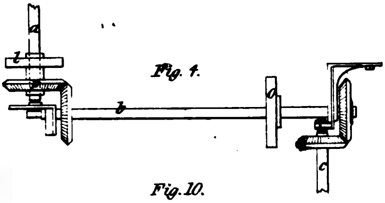

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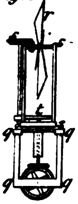

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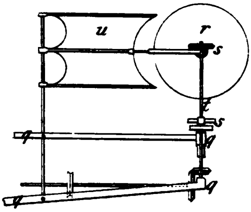

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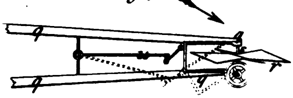

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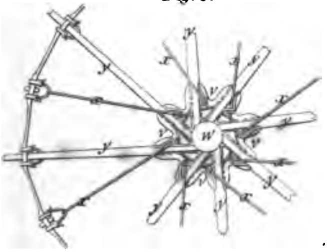

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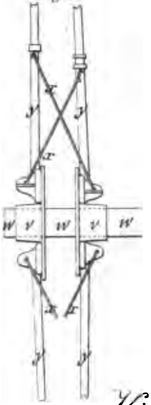

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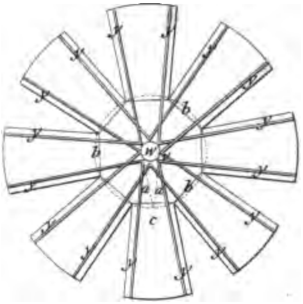
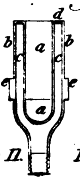


Kilby & Bacon's Gas burners.



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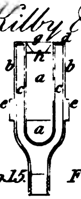

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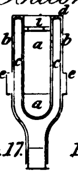

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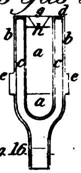


Fig. 16.

Fig. 12

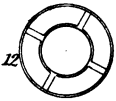


Fig. 13

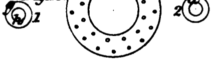


Fig. 14

Fig. 19.

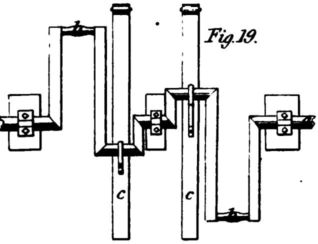
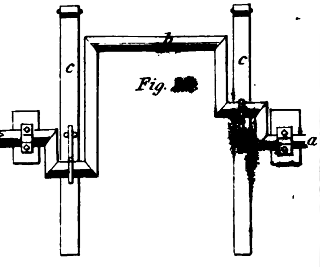
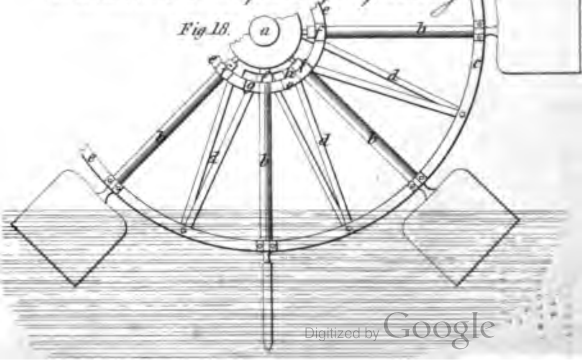


Fig. [illegible]



Harsteben's Impt. in propelling

Fig. 18.



Kitchen & Smith's impd. Window Frames & Shutters.

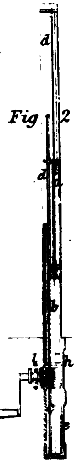
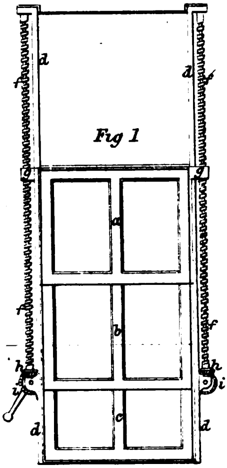


Fig 2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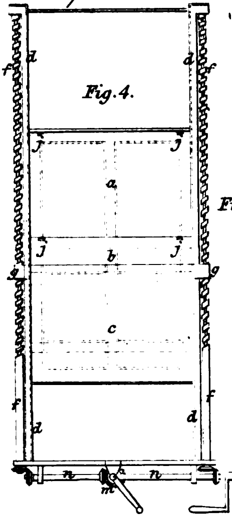
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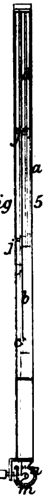
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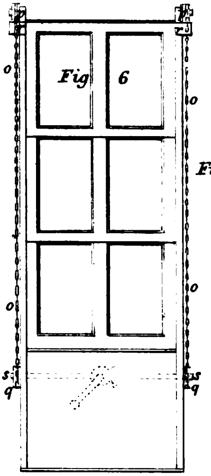
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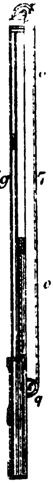
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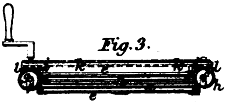
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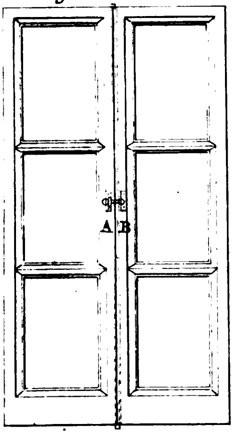
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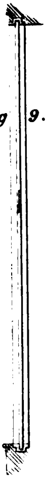
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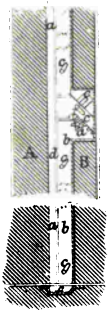
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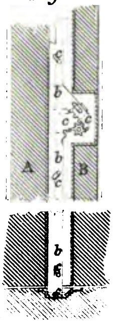
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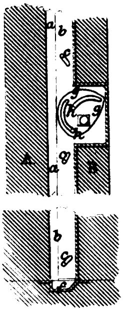
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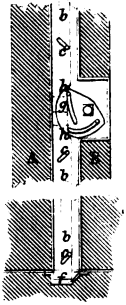
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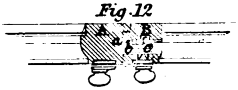


Fig 12

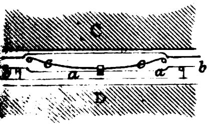
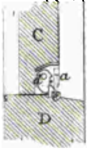


Fig. 15.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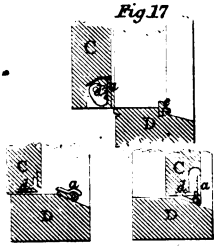
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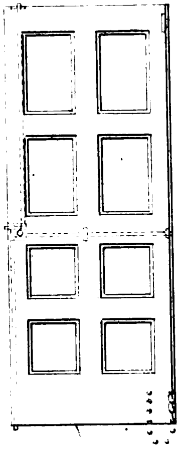
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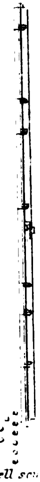
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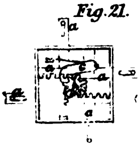
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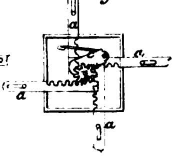
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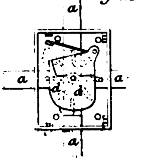
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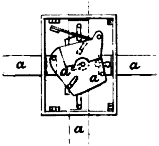
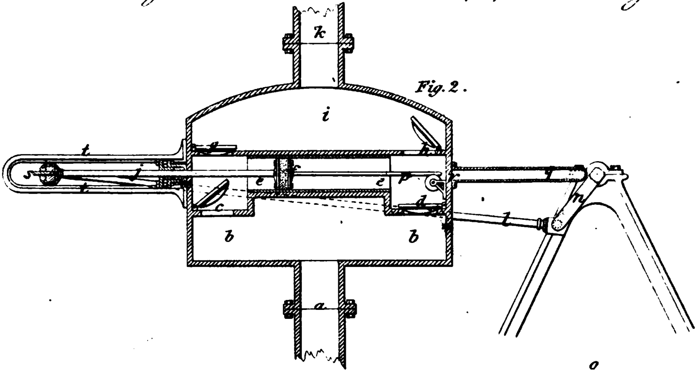


Fig. 22.

W. Newton delt. 1 April 1830. F. Mansell sculp.

Vaughn's Machine or Pump for raising water.

Fig. 2.



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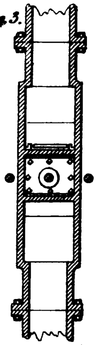
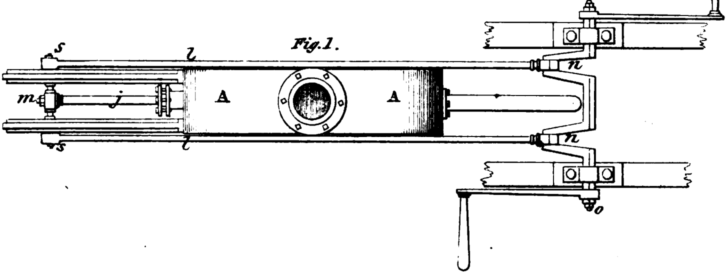
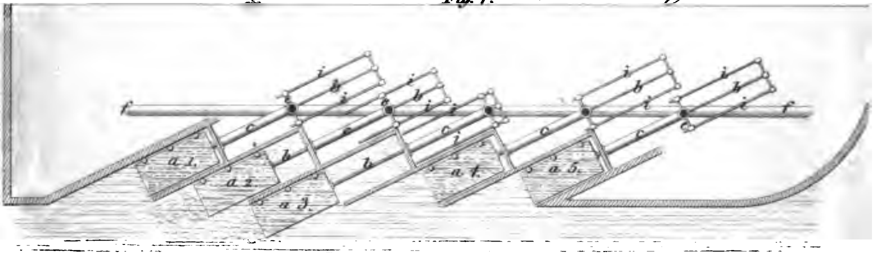


Fig. 1.



Dutton's Improvements in propelling.

Fig. 4.



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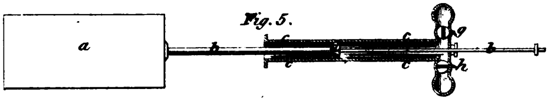
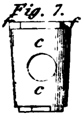


Tucker's Improvements in Cannon.

Fig. 7.



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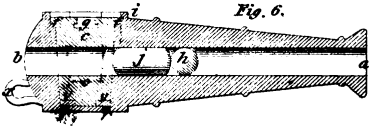

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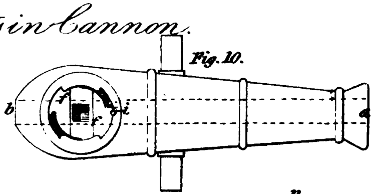

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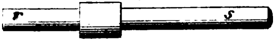

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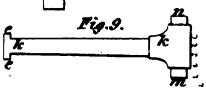
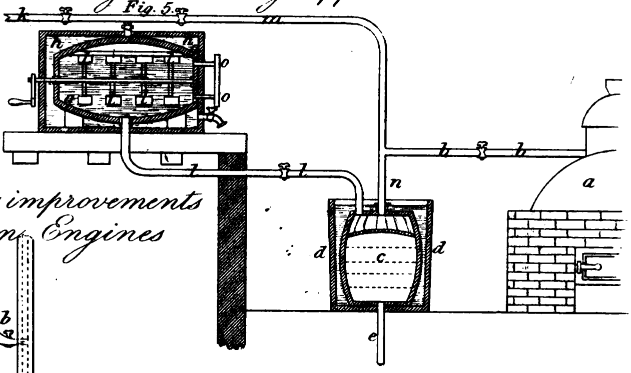


W. Newton delt. 1st May 1830. G. Gladwin sc.

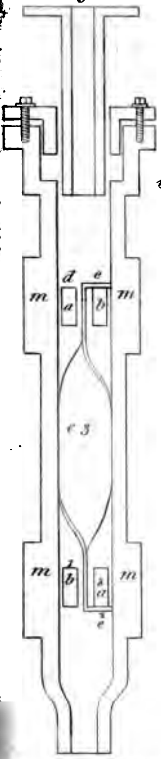
Dove's Sugar Boiling App^ts.

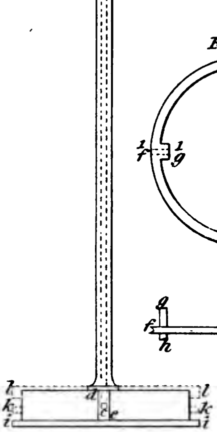
Fig. 5.



Bank's improvements in Steam Engines

Fig. 1.





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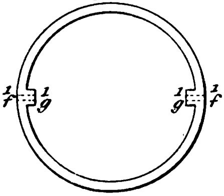

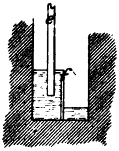

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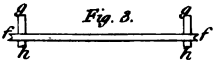
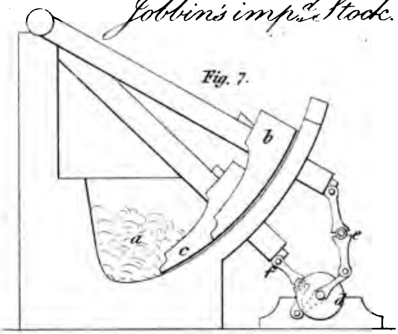
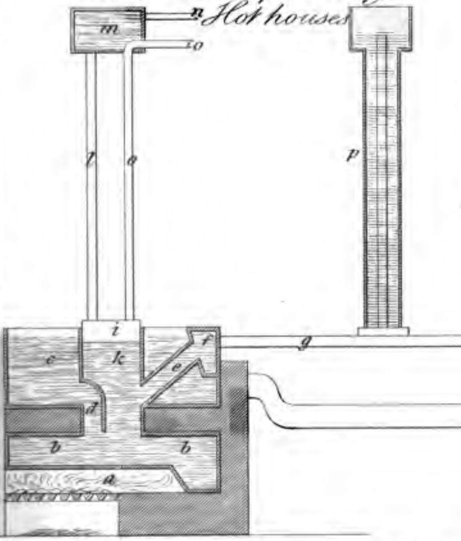


Jobbin's imp^d. Stock.

Fig. 7.

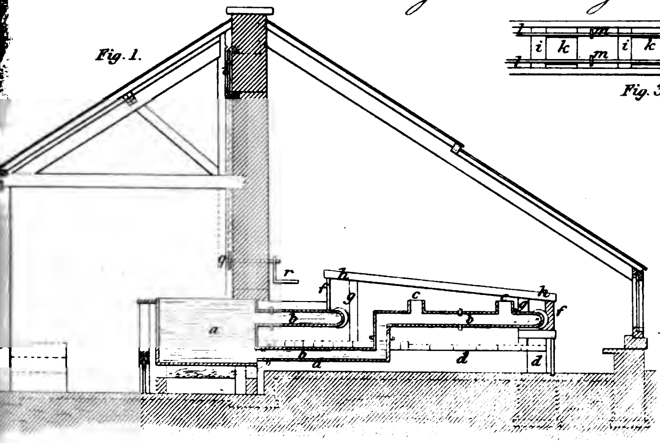


Week's method of heating Hot houses



Knowles on heating & Ventilating hot houses.

Fig. 1.



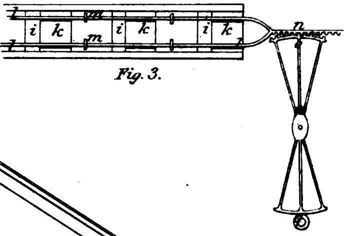
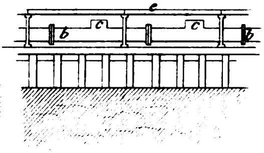


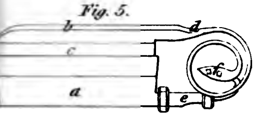
Fig. 3.

Fig. 2.



Clutterbuck's Imp.d Shears.

Fig. 5.



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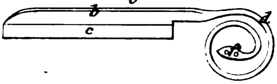

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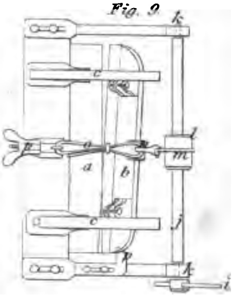

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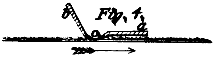

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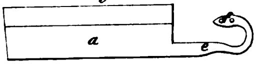

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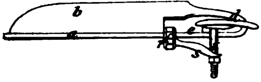

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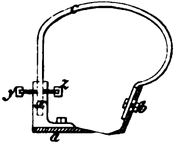

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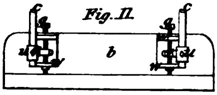

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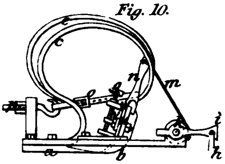
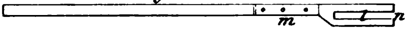


Straker's Imp.ts in Windlasses.

Fig. 16.



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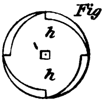

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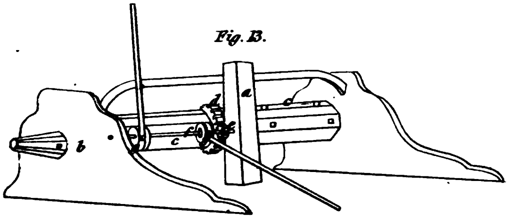

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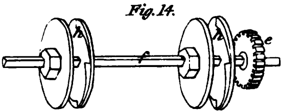
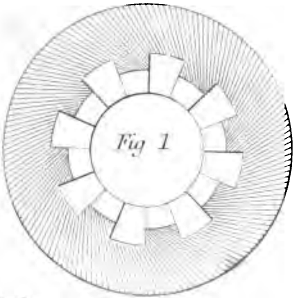


W. Newton del. 1st June 1830. Mansell sc.

Church's Apparatus for Sharpening Knives &c.



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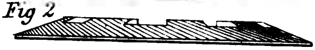

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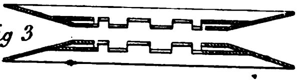

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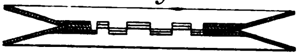

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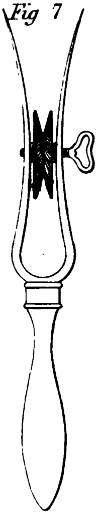

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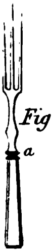

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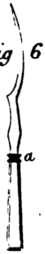
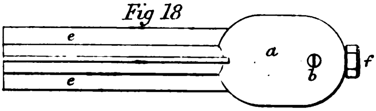


Tucker's Impd. Projectile

Fig 18



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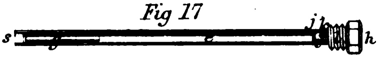

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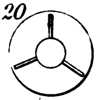

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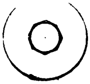

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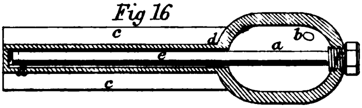

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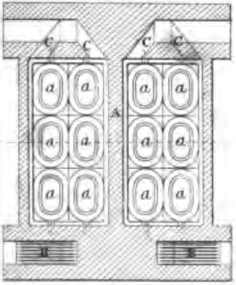

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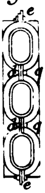

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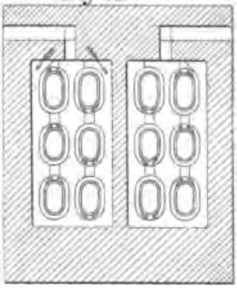
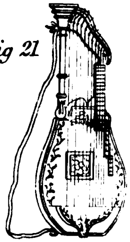


Ventura's Harp Lute

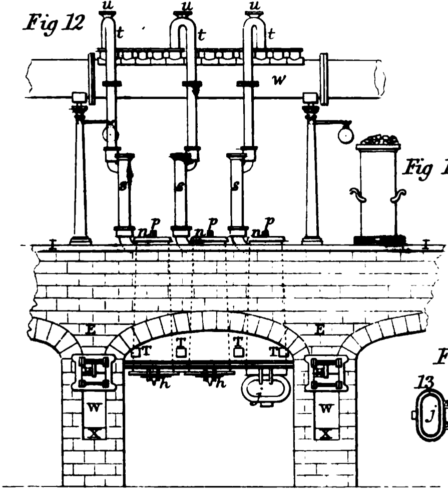
Fig 21



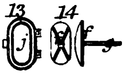
Brunton's Gas Apparatus

Fig 12

Fig 15



Figs 13 14



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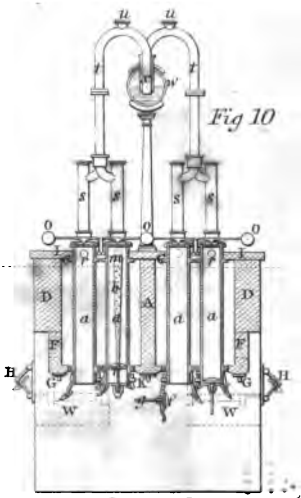
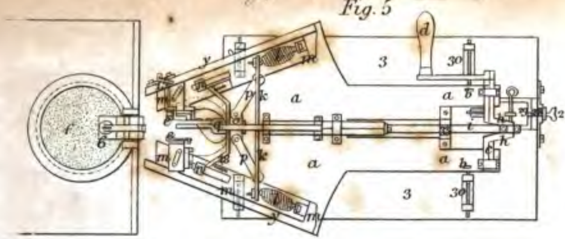


wton. delt.   1 June 1830.   G. Gladwin Sc

Aspinwall's Type founding Appts.

Fig. 5



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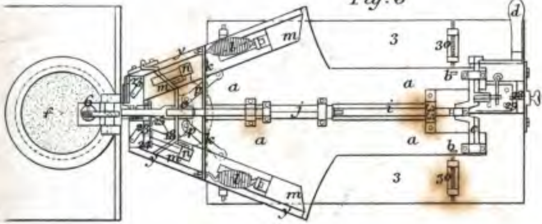
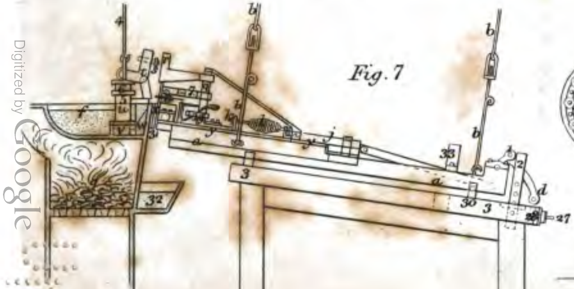


Fig. 7



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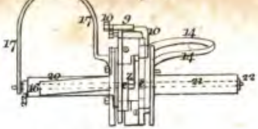

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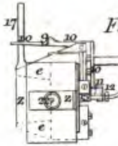

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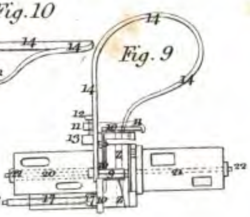


Wright's Impt. in Cranes.

Fig. 2

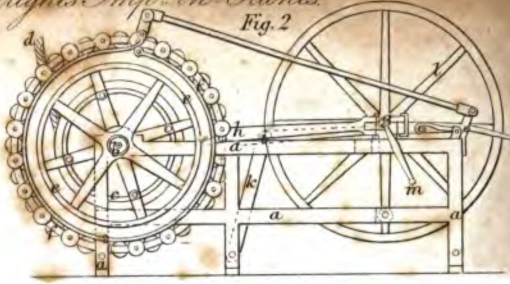
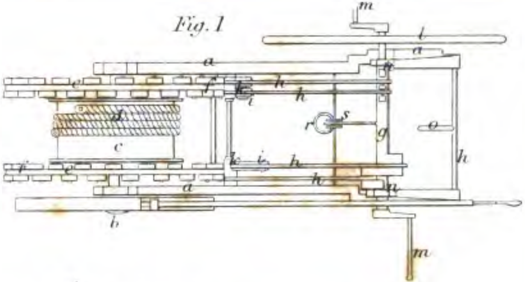


Fig. 1



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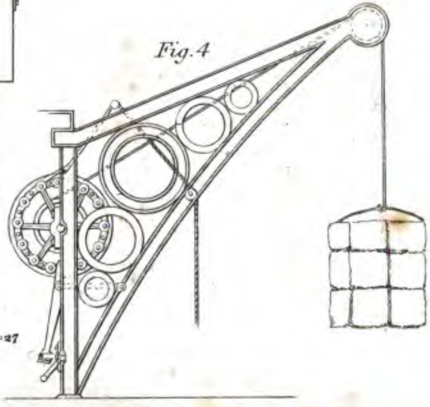

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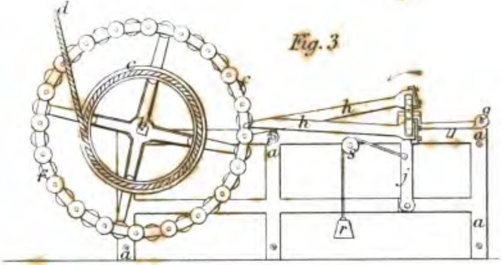


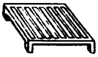
W. Newton, delt.

1. July 1830

F. Mansell Sc.

Fonzi's Impd. Stove Grate.

Fig. 4.



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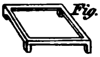

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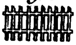

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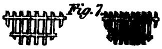

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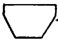

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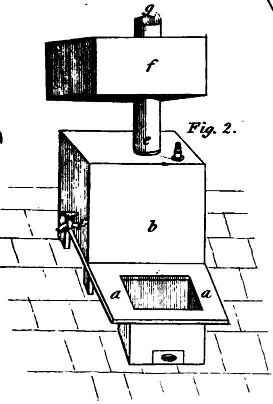

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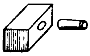

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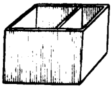

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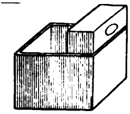

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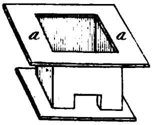

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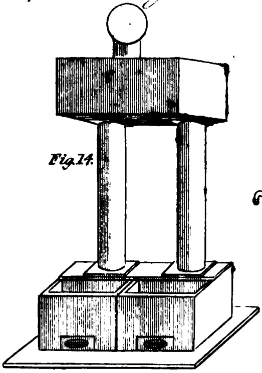

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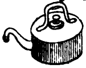

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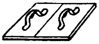

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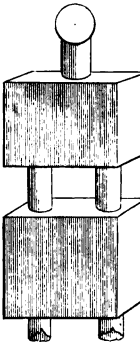

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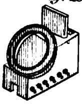

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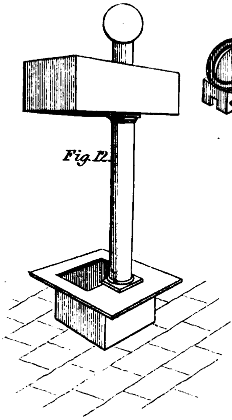

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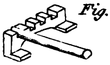

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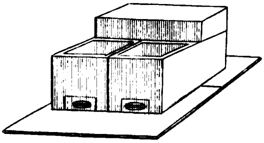
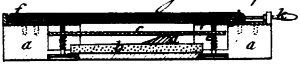


Westby's Impd. Sharpeners for Knives &c.

Fig. 20.



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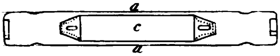

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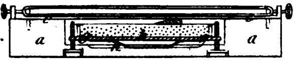

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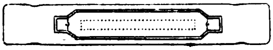

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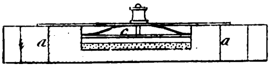

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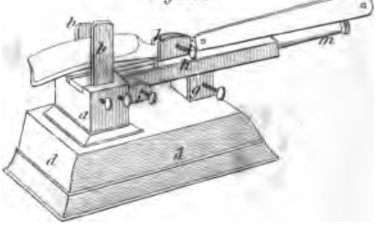

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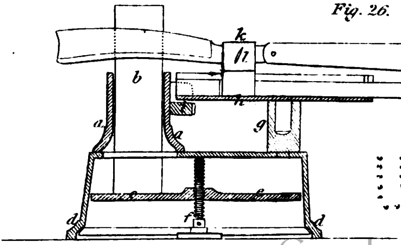

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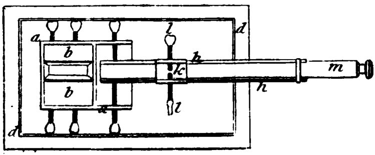
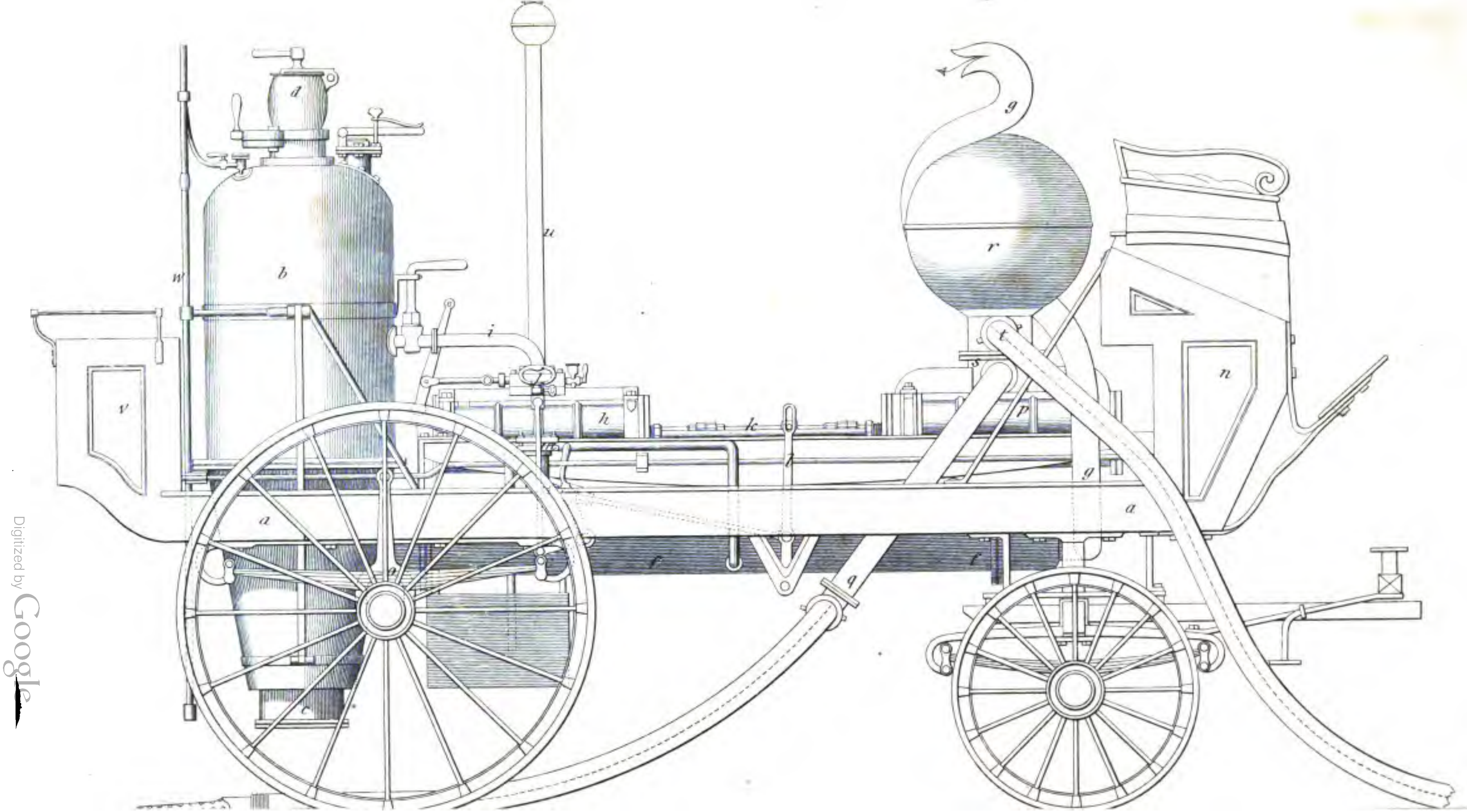


1st July 1830.

Mess.rs Braithwaite & Ericsson's Steam Fire Engine.



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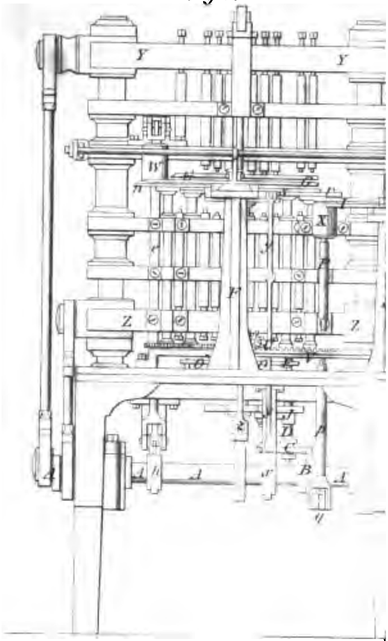

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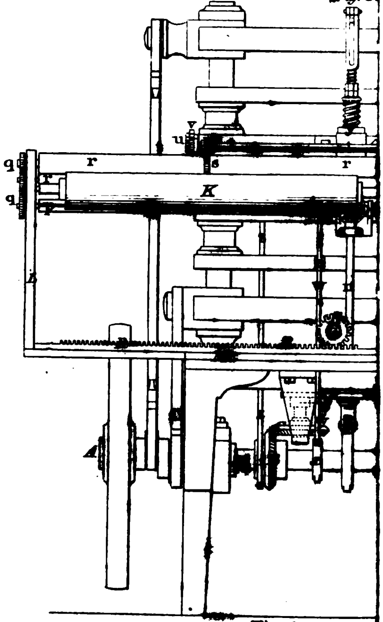

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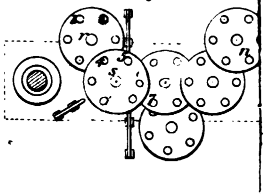

W Newton, del.

Prior's Imp^{d}. Fid.

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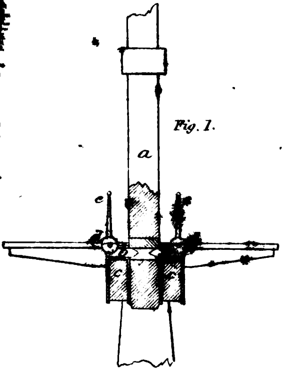

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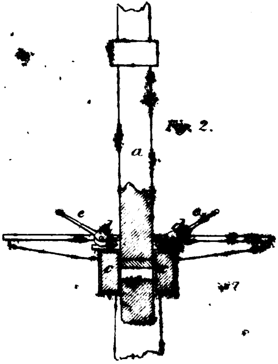

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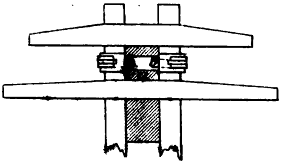

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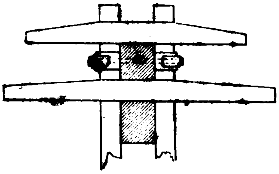

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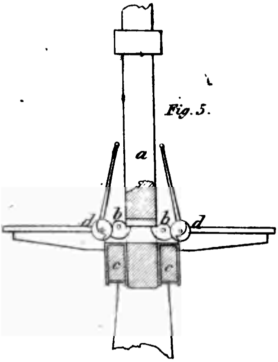

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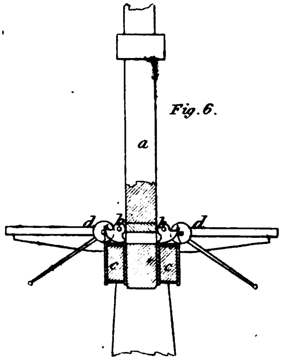

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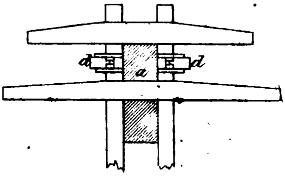

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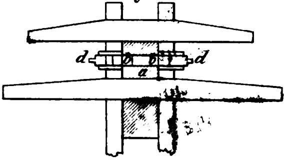
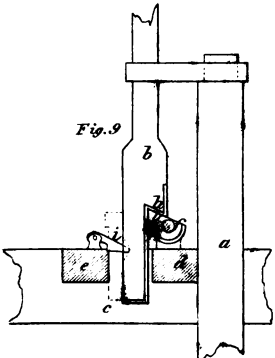


Brooking's Imp^{d}. Fid.

Fig. 9.



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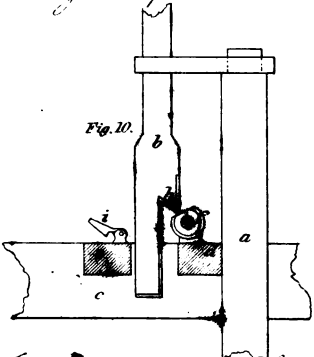

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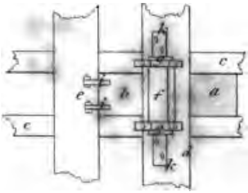
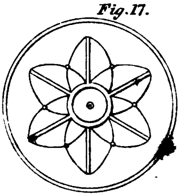


Bates Imp^{ts}. in Whitening Sugars.

Fig. 17.



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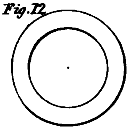

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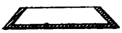

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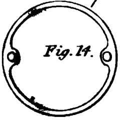

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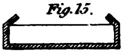

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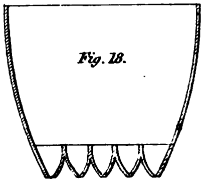

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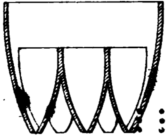


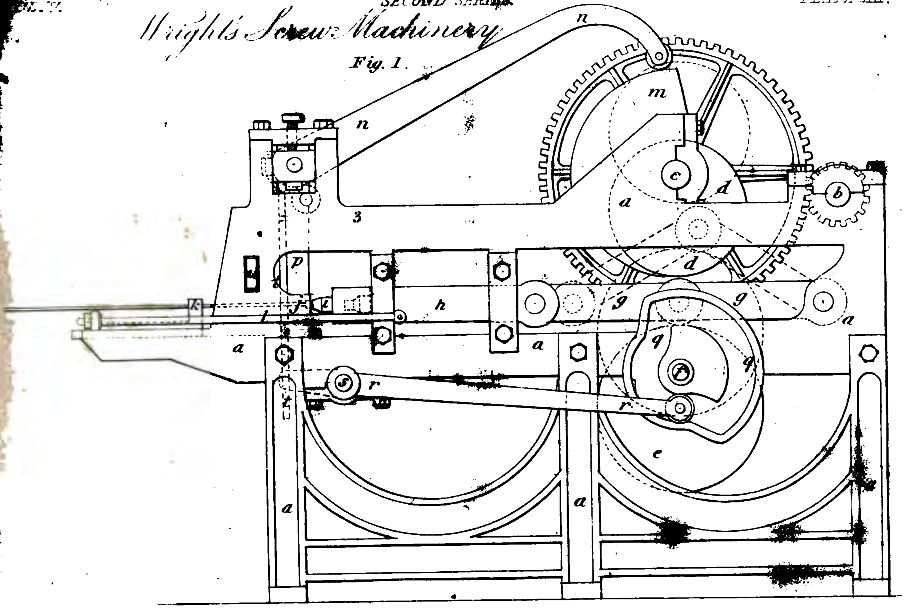
W. Newton Del^{t}.

1st August 1830.

F. Mansell Sc.

Wright's Screw Machinery

Fig. 1.



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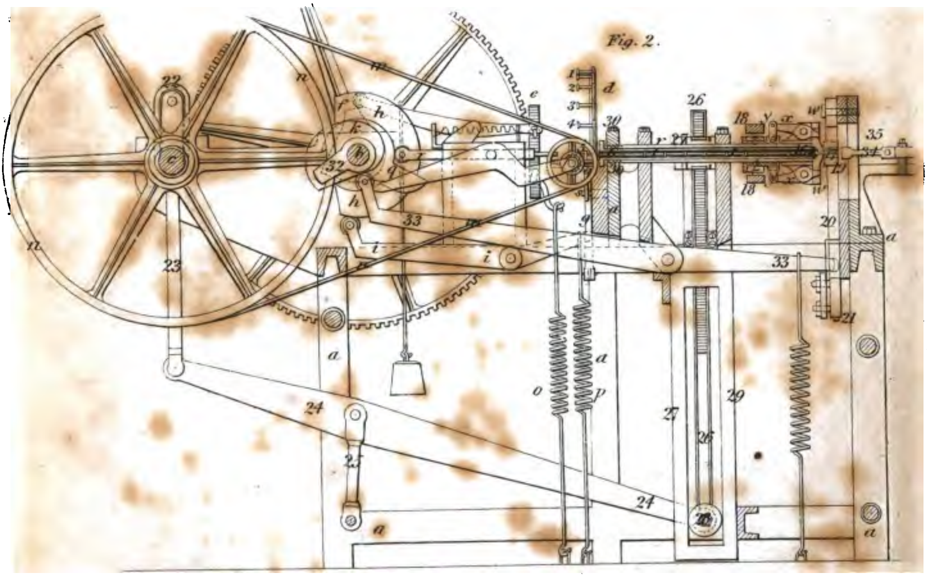

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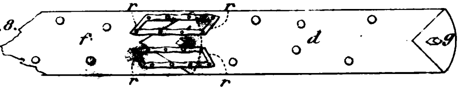


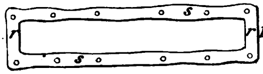


Fig. 5.

Green's Impd. Masts.

Fig. 7.

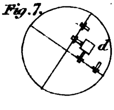
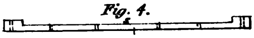


Fig. 6.

Fig. 4.



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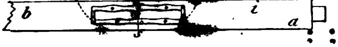

W. Newton Del.t

1st Septr 1830

T. P[illegible] Sculpt

Dexter's Spinning Machinery.

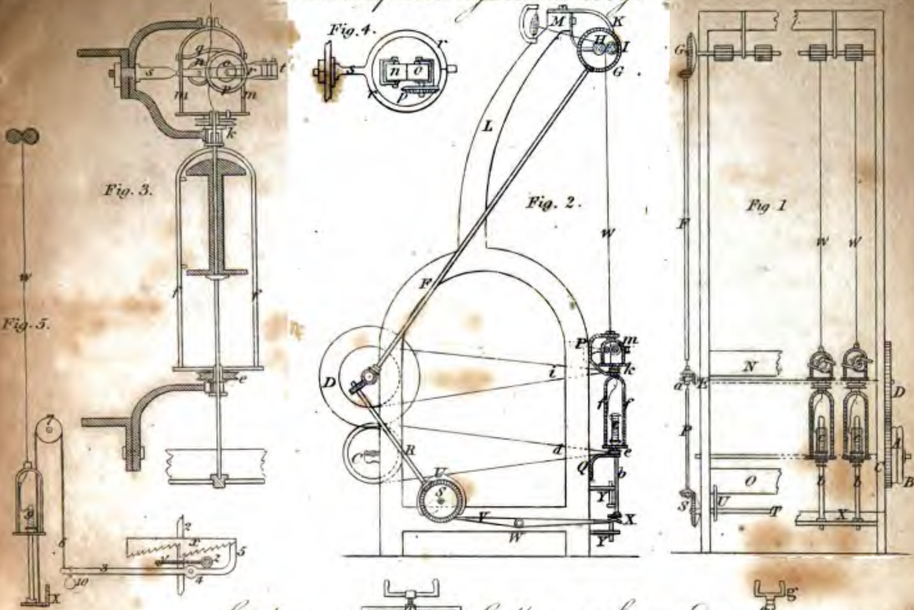
Fig. 1.
Fig. 2.
Fig. 3.
Fig. 4.
Fig. 5.
M K H I G L F W D i P m k f d e C R U S Q b Y V W X Y
G F N a E P S U O T X W W D A C B b b
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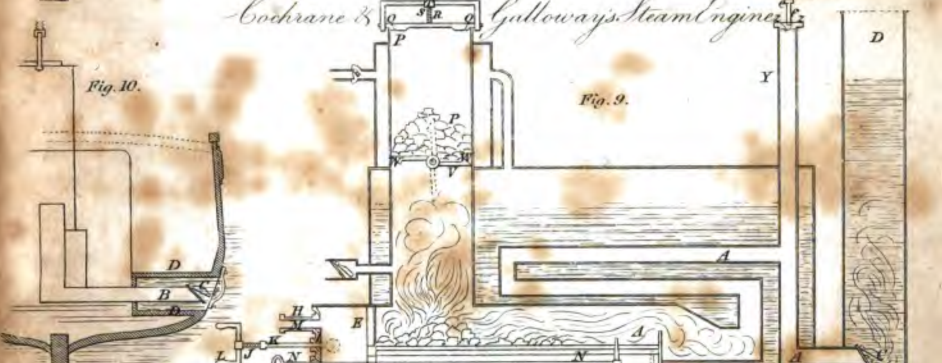
Cochrane & Galloway's Steam Engine.



Brook's Spinning Machinery.